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No. 2—Retention of the Placenta in the Bovine *

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The College Hall at the Royal (Dick) Veterinary College was again filled to overflowing on the morning of Tuesday, July 29th, 1947, when Mr. Kennedy's paper was discussed, under the chairmanship of Mr. R. W. Johnston, M.R.C.V.S., Longside, Aberdeenshire.

Introducing the essayist, the CHAIRMAN said that Mr. Kennedy had chosen a subject which was of great importance to the general practitioner. This was the type of case which was the bug-bear of the veterinary surgeon. He had much pleasure in inviting Mr. Kennedy to make a few introductory remarks.

Mr. KENNEDY said that he was anxious to hear members' views on this very interesting condition, and he hoped he had been able to put forward some headings for discussion. He was not an expert who could give very much help or could make things easier in practice, but he had brought forward several points for discussion. He would try to answer queries and to explain any conditions as well as he could.

Following is the text of Mr. Kennedy's paper, which had been circulated in advance to members of the Association.

Retention of the Placenta in the Bovine

An attempt to study the above condition soon shows what wide excursions are necessary into numerous branches of science, before any satisfactory specific knowledge can be obtained. It must be remembered also that endocrinology, a science likely to be of much assistance, is of somewhat recent development and the discovery of sex hormones and methods for their preparation may be classed as fairly new achievements.[1] In spite, however, of limitations in knowledge in at least one of the relevant basic sciences, it does seem advisable that some attempt should be made to proceed with a systematic examination of the subject in question. Accordingly this essay is presented, its content being arranged below under several headings and sub-headings, which, it is hoped, will cover a good proportion of those considerations which are of interest to scientific workers in the laboratory and in the field.

Incidence

It is regretted that it has not been possible for the writer, in the somewhat short period available for the preparation of this essay, to make the necessary search in the literature for information regarding retention of the placenta in the bovine. The following American account of the incidence[2] has, however, been noted and the following interesting data are tabulated below:—

Number of cows in two American herds (the herds being completely free from tuberculosis and abortion)	125
Average number of cases per annum of retention of the placenta (44 in three years)	14·6
Average percentage of cases per annum ...	11·7 per cent.

The writer's own records of incidence show a somewhat smaller percentage, as follows: Every case of calving was recorded in 13 herds. The cattle were under good average management, and were composed of approximately 95 per cent. Ayrshires and 5 per cent. Friesians. Five herds were recorded over twelve consecutive months (208 calvings), six for ten consecutive months (204 calvings) and two for a shorter period (19 calvings).

The results are set out below:—

Number of normal calvings	395
Number of cases of retained placenta, including five cases of abortion	36
Percentage of cases of retained placenta ...	8·3 per cent.

In addition to these cases where there is actual retention of the placenta, a number are encountered which may be termed unhealthy calvings, characterized by inflammatory changes of the genital organs and excessive discharges. These are conditions possibly analogous in their pathology and aetiology to the subject under discussion.

Economic Importance

To calculate the economic importance of retention of the placenta in the bovine, comparative data would be required from a large number of cases of this condition and an adequate number of controls. A variety of clinical changes would deserve careful consideration in arriving at an accurate conclusion. Some of these have been noted by Palmer[3] in 44 cases of retention as follows:—

Subsequent clinical changes.	*In 44 cases of retention.*	*In 44 cases of normal parturition.*
Subsequent sterility	3	2
Abortions terminating next pregnancy	6	4
Number of days before next parturition	429	419
Appetite and milk secretion	55 per cent. "reported fair"	Appetite and milk secretion normal in all cases.

An analysis of the results of retention of the placenta in the bovine has been published by Götze[4] who reports as follows: Of all cases of retained placenta seen in the Hanover clinic:—

3 to 4 per cent. of cases died,
20 per cent. suffered long illness and infertility,
50 to 60 per cent. passed through a short period of illness and infertility, and
15 to 25 per cent. showed no ill-effect.

In Britain, it may be stated generally that the clinical importance of this condition is fully appreciated by the farmer and practising veterinarian, and public health authorities rightly designate it as one of those conditions which render the milk unfit for human consumption, but as far as the writer is aware, it has never been the subject of comprehensive investigation in the completed programmes of veterinary research.

Normal Anatomy and Physiology

At normal parturition in the bovine the uterus and placenta have reached their maximum size. The uterus consists of two well-developed muscular layers, an outer longitudinal and an inner circular. The muscle fibres are greatly increased in size as has been demonstrated by Hammond[5] who counted 22 muscle nuclei per microscopic square in the muscular layer of the virgin heifer and only four in the same microscopic field when examining a section of uterine muscle at the seventh or eighth month of pregnancy.

In the vascular connective tissue between the circular and longitudinal muscle, well-marked changes in the size of the blood vessels at various stages of pregnancy have been recorded by Hilty[6] (quoted by Hammond), an example of his findings being shown below:—

	Size of Arteries in Vascular Zone	
Stage of Pregnancy.	*Lumen.*	*Walls.*
6th week	80μ	130μ
15th week	360μ	460μ
26th week	620μ	380μ
29 days *post partum* ...	112μ	256μ

The same author describes similar changes in the cotyledonary arteries, a short example of the type of change being shown as follows:—

	Size of Cotyledonary Arteries	
	Lumen.	*Walls.*
3 days *post partum* ...	140μ	160μ
43 days *post partum* ...	80μ	240μ

* Presented to the Sixty-fifth Annual Meeting of the National Veterinary Medical Association, at Edinburgh, on July 29th, 1947.

The mucous membrane of the uterus consists of the cotyledons, specialized for attachment to the placenta, and the intercotyledonary area, occupied chiefly by glands in active secretion during pregnancy. The latter vary in size as in the following example:—

	Lumen.	*Epithelium.*
Pregnant 6 weeks ...	40μ	16μ
Pregnant 26 weeks ...	160μ	22μ
Post partum 3 days ...	144μ	20μ
Post partum 21 days ...	45μ	16μ

The cotyledons change greatly in size during pregnancy and the *post partum* period, as indicated in the table below:—

Size of Cotyledons in Cow

	Length.	*Breadth.*	*Height.*
Pregnant 6 weeks ...	9 mm.	4 mm.	3 mm.
Pregnant 26 weeks ...	78 mm.	34 mm.	26 mm.
Post partum 7 days ...	45 mm.	36 mm.	13 mm.
Post partum 21 days	13 mm.	11 mm.	4 mm.

These measurements (all recorded by Hilty) are interesting in the study of this condition of retention of the placenta, in that they demonstrate the natural tendency of the uterus to decrease rapidly in size during the first part of the puerperium.

There is no doubt that much work remains to be carried out in an attempt to determine the changes in the genital organs of the cow at various stages of parturition and the puerperium. For our present study, however, the writer has been able to give some consideration, only to the histological structure of one detail of structure at one particular stage, as follows:—

The normal cotyledon is somewhat mushroom shaped and projecting from the uterine mucous membrane into the cavity of the uterus. When pregnancy is well advanced it is reported to consist of a vascular connective tissue, becoming denser internally to support the numerous large blood vessels entering from the hilus. The external area for placental attachment is covered by a low cuboidal epithelium invaginated into a great number of crypts accommodating the digitations from the chorion. The placenta consists of a loose vascular connective tissue forming a thin membrane. Over the cotyledons numerous digitations are formed, which are everywhere in close contact with the maternal epithelium. The chorionic epithelium, like the cotyledonary, is a low cuboidal type.

In an attempt to define the *structure of the normal cotyledon and attached placenta*, 31 histological sections have been examined, at an average time of 4¾ hours after normal calving. Difficulty was experienced in preparing sections of placenta; for this membrane becomes very readily detached.

Reports on 26 specimens of placenta are available, however, and make uniform mention of degeneration and necrosis of the foetal elements. In the 31 maternal cotyledons examined the following features are described:—

(1) Epithelium distinctly visible in many cases but in others absent, the outlines of the cotyledonary crypts being obliterated.

(2) Necrosis and degeneration of epithelium.

(3) Crypts filled with tissue debris both foetal and maternal.

The time taken for expulsion of the placenta after calving is the main criterion as to whether this function is normal or abnormal in any given case. Sommer[7] (quoted by Hammond) gives the average time as four and a half hours, Romolotti[8] (quoted by Hammond) as five hours. External infection of the foetal elements develops quite rapidly, in the warmer seasons of the year as early as eight hours after calving. This process cannot be termed a physiological one, and on this account the writer is of opinion that retention is not physiological after the lapse of eight hours. Götze[10] argues on similar lines, and mentions the longer period of twelve hours as the normal limit.

Pathology and Pathological Processes Involved

In retention of the placenta in the bovine, external infective processes, after a short interval, begin to play an important part in producing changes in structure and modifications in function within the various systems of the animal body. The true nature of the condition must, therefore, be studied before these processes supervene, *viz.*, within or before the interval after calving, during which normal expulsion occurs. Changes and abnormalities, evident before the termination of this interval, are the principal ones which can be taken into account in the investigation of pathological processes relative to aetiology.

In the early period defined above, it ought to be possible to discover some changes in structure and function, indicating pathological processes resulting in retention of the placenta, although it will readily be understood that there are many practical difficulties, preventing detailed and complete investigation of reproduction in the cow. Under appropriate sub-headings consideration in regard to pathology will be given to each of the physiological systems, as follows:—

Genital System

Ovaries.—These organs are inaccessible to rectal examination at parturition, and the writer regrets that he has no accurate record of observations on ovaries in cases of retention of the placenta at this time.

Uterus.—Histological sections through uterus and placenta were examined from 24 cases of retained placenta in the early stages. In ten of these cases the placenta had become detached and no description of its structure could be given. The laboratory reports on these cases were as follows:—

Histological Structure of Placenta in 14 Cases of Retention

Description.	*Number of Cases*
Widespread necrosis present, particularly involving the chorionic villi, with focal leucocytic infiltration	1
No visible difference in structure from the normal placenta, as already described ...	13

Histological Structure of Maternal Cotyledons in 24 Cases of Retained Placenta Including 1 Case of Abortion

Description.	*Number of Cases.*
No visible difference in structure from the normal cotyledon as previously described ...	24

These cases were in no way selected ones, although mostly obtained from herds where contagious abortion was in a quiescent state (17 cases). In the other seven brucellosis was occurring clinically about the time the specimens were obtained. Although hardly existent in the writer's cases, inflammatory change is probably frequently associated with retention of the placenta in the bovine. In the past many retentions were observed in outbreaks of *Br. abortus* infection, but with careful immunization of cattle against this disease, fewer of this type should be encountered in the future.

The following histological description of a cotyledon, from a herd where brucellosis was rampant, will serve to demonstrate the type of pathological change which must frequently occur. This cotyledon, from a case of abortion at the sixth month with a positive agglutination test, showed cotyledonary crypts filled with necrotic and infected foetal elements, and there was marked evidence of inflammation (infiltration of neutrophils, etc.). Another illustration of inflammatory change was found in the placenta of a cow which calved up to time but with the calf dead and with retention of the placenta. The animal was positive to the agglutination test and, as described previously, was affected with focal leucocytic infiltration particularly involving the chorionic villi.

Inflammatory change in the uterus, being present for a variable period before calving, is capable of causing general clinical signs, a consideration worth remembering in the course of general diagnosis.

Diagnosis of specific *Br. abortus* infection as a cause of retention of the placenta cannot, of course, be made solely from the evidence of a positive agglutination test. Many cattle react positively after vaccination, while it is well known that positive reactors may have successful breeding records for many years after infection with clinical brucellosis. On the other hand, clinical abortion frequently occurs, followed after a considerable lapse of time by a positive reaction to an agglutination test for *Br. abortus*. In a series of 137 cases of retention the writer found 57 positive to the agglutination test and 80 negative, but, for the above reasons, it is difficult to draw any significant conclusions from these facts.

Before discussing change in function of the genital system and its aetiological significance in retention of the placenta in the bovine, it is well to state that, although several theories have been put forward, there seems to be no positive evidence, at least to the writer's knowledge, as to the direct cause either of normal expulsion or pathological retention of the placenta. Possibly there is no structural change in the structure of placenta and cotyledon to account for retention as in the writer's findings, but it would appear that much interesting and useful work remains to be carried out on the histology of the bovine uterus and placenta at parturition. It may be that some sudden specific change in foetal or maternal circulation is necessary for normal expulsion of the placenta. Pomayer[9] concluded, from histological examination, that retention of the foetal membranes may occur as the result of congestion of the blood vessels, which causes close interlocking of the

tissues. Hammond[11] and Pomayer both conclude that the contraction of the muscular coats of the uterus is an essential factor. Rudolph and Ivy[12] (quoted by Reynolds) present some interesting evidence regarding expulsion of the placenta in the bitch, which may have some application in the case of the bovine. Reynolds'[12] account of their observations is as follows : "One to five minutes after a foetus is born the ampulla, from which it came, undergoes longitudinal shortening and circular contraction. As a result of this movement the placenta is separated, because it may be removed easily after this particular action but not before."

To discover change in function in circulation and muscular action, quantitatively and qualitatively, in the uterus of the bovine, would, in the writer's opinion, be a matter of great difficulty in practice, and he has no evidence as to the mechanisms directly involved in the expulsion of the placenta. Clinical findings in 301 cases of retention of the placenta in the bovine are, however, tabulated at this juncture, and discussed later under their appropriate headings.

Synopsis of results of a systematic clinical examination of 301 cases of retained placenta in the bovine is given in the table.

Although the large majority of these clinical observations were made two or three days after calving, a number have been recorded during the period before the normal limit of time for expulsion of the placenta.

Twin pregnancy occurs in 7 per cent. of all cases, and, as this condition is not specially common in the bovine, the above percentage must be considered of significance. In twin pregnancy there occurs undoubtedly a tendency to weakness in circulation and poorness of nutrition. There must also be great distension of uterine muscle, while more than average energy is generally required for the completion of parturition. The above considerations may logically be considered as closely associated with the aetiology of retention.

Clinical abortion occurs in 9·6 per cent. of these clinical cases, again a significant figure. Brucellosis, an inflammatory condition, causes a definite amount of change in structure in the uterus and within it, and change in function and retarded expulsion of the placenta is a possible sequel. It is more difficult to suggest a reason for retention in those cases of abortion where no inflammation is present.

Mastitis, of marked severity, was observed in six cases before calving, and in another 15 cases in the first few days *post partum*. The information available does not warrant any special conclusion.

Circulatory System

It is only logical to state that normal composition of the body fluids and an efficient circulation are essential for normal structure and function of all the physiological systems. In diseased conditions, therefore, careful consideration must be given to variations in blood composition and of the general circulation.

The possibility of a demonstrable quantitative change in the composition of the blood, in cases of retained placenta, must have occurred to many clinicians. The writer has been able to obtain only a limited number of samples of blood in cases of retained placenta, within the period which is important in the aetiology, *viz.*, during the first twelve hours after parturition. The results of the analysis are shown below:—

20 *Cases of Retained Placenta Within Twelve Hours After Calving*

Values per 100 *c.c. Blood*

	Range.	Mode.
Sugar (mg.)	46·7 to 147·0	50 to 70
Haemoglobin (g.) ...	6·4 to 12·6	9·0 to 11·0
Cl. as NaCl (mg.) ...	460 to 540	480 to 540
Calcium (mg.) ...	7·0 to 13·1	7·0 to 11·0
Potassium (mg.) ...	16·0 to 51·1	15·0 to 30·0
Sodium (mg.)	322 to 350	325 to 350
Total P. (mg.)	Trace to 8·6	5·0 to 7·0
N.P.N. (mg.)	24·5 to 88·0	30·0 to 50·0
Amino N. (mg.) ...	3·50 to 7·45	3·5 to 6·5
Inorganic P. (mg.) ...	Trace to 6·02	2·0 to 5·0
Magnesium (mg.) ...	1·48 to 3·85	2·0 to 3·0

37 *Normal Cases During the First Eight Hours after Parturition*

Values per 100 *c.c. Blood*

	Range.	Mode.
Sugar (mg.)	41·5 to 87·7	55 to 65
Haemoglobin (g.) ...	6·4 to 13·6	9·0 to 12·0
Chlorine as NaCl (mg.)	400 to 600	500 to 550
Calcium (mg.) ...	6·0 to 13·0	9·0 to 10·0
Potassium (mg.) ...	15·9 to 83·0	20·0 to 25·0
Sodium (mg.)	323 to 369	330 to 345
Total P. (mg.)	4 to 10·7	6·0 to 8·0
N.P.N. (mg.)	22·9 to 71·0	30·0 to 50·0

Physiological system	Clinical change, or condition noticed	Number of cases	Percentage of cases	Details of time when changes were observed (0 denotes "at calving"; — denotes days before calving; + denotes days after calving; ? denotes time uncertain)		
Genital.	Abortion	29	9·6		All cases 0	
	Twin pregnancy	21	7·0		All cases 0	
	Marked vaginitis	7	2·3		0, 0, 0	+ 1, + 2, + 3, + 3.
	Prolapse vagina	2	0·7	— ?, — ?		
	Minor injuries, vagina and vulva ..	8	2·7		All cases 0	
	Mastitis, severe or marked ..	21	7·0	— 60, — ?, — ?, — ? — 4.		+ 1, + 1, + 1, + 1, + 2, + 2, + 2, + 2, + 2, + 3, + 3, + 3, + 3, + 5, + 6.
Circulatory.	Poor state of nutrition	18	6·0	— ?		+ ½, + 1, + 2, + 2, + 2, + 2, + 2, + 2, + 3, + 3, + 3, + 3, + 3, + 3, + 5, + 7.
	Subacute upset	19	6·3	— ?, — ?, — 2, — 7.	0	+ 1, + 1, + 1½, + 2, + 2, + 3, + 3, + 3, + 3, + 4, + 4, + 5, + 6, + 10.
	Acute upset— (*a*) "Milk fever"	15	5·0		0, 0, 0,	+ , + ½, +, ½ ½, + 1, + 1, + 1. + 1, + 2, + 2, + 2, + 2, + 2.
	(*b*) From various causes ..	12	4·0	— 24, — 5, — 3.	0	+ ½, + ½, + 1, + 2, + 2, + 3, + + 8.
	Marked upset from accidental external causes, including dystokia	13	4·3	— ?, — ?, — ?, — 3.	0, 0, 0, 0, 0, 0, 0, 0,	+
	Possibility of upset (animal being subjected to a journey by mechanical transport)	15	5·0	— 10, — 9, — 7, — 7, — 5, — 4, — 3, — 3, — 2½, — 2, — ½.	0, 0.	+ ½, + ½.
Alimentary.	Marked scouring	7	2·3	— 30,	0, 0.	+ 1, + 1, + 2, + 2.
Respiratory.	Pneumonia. Severe, two cases; less severe inflammation, 22 cases	24	8·0	— 30, — 5, — ?, — ?		+ ½, + ½, + ½, + 1, + 1, + 1½, + 2, + 2, + 2, + 2, + 2, + 2, + 2, + 2, + 3, + 3, + 3, + 3, + 4, + 4, + 4,
Nervous system.	Marked nervousness	2	0·7			+ 1, + 2.
Skeleto-muscular system.	Pain and inflammation in limbs ..	12	4·0	— 60, — 60, — ?, — ?, — ?, — ?		+ 2, + 2, + 4, + 4, + 5, + 14.

Amino N. (mg.) ...	3·84 to 10·77	4·0 to 7·0
Inorganic P. (mg.) ...	1·82 to 6·30	2·0 to 4·5
Magnesium (mg.) ...	1·49 to 3·75	2·5 to 3·5

Comparison of the cases of retention with normal bloods reveals no significant differences, but the results of analysis of a large number of bloods might show to what extent blood changes are actiological in this condition.

Hormones from various endocrine glands are known to be active in the animal body and a knowledge as to their concentration in the blood at parturition would be interesting, and possibly of importance in this present study. The writer has not succeeded in obtaining any information regarding the above, and there is no doubt that there are many scientific difficulties in the way of accurate determination, quantitatively and qualitatively, of the presence of these sex hormones in the body fluids.

The blood stream, as is well known, is the carrier of viruses, bacteria and toxins, which can cause direct damage to structure, and cause modification of function in all parts of the body. The writer can only point out the likelihood of injury in cases of severe mastitis, pneumonia and nephritis. It does seem possible, however, from a study of the clinical cases tabulated above, to arrive at some conclusions regarding the effect of changes in the force and rate of the heart beat on the function of the bovine uterus at parturition.

Marked changes in the circulation are a prominent result of local pathological processes of any severity, such as those listed above.

Prior to the normal limit of time for expulsion of the placenta, it was definitely established (*see tables above*) that the following conditions were present:—

	Number of Cases
Poor state of nutrition	2
Subacute upset	5
Acute upset:	
(*a*) milk fever	6
(*b*) from various causes	6
Accidental external causes including dystokia ...	13
Transport by mechanical means	15
Marked scouring	3
Pneumonia	7
Pain and inflammation of limbs	6

Some of the clinical conditions are recorded as occurring later in a good percentage of cases; there was no opportunity to examine the particular animals before the above-mentioned time. It seems difficult to argue, however, that many of them were not present prior to the normal limit of time for expulsion of the placenta. The poor state of nutrition, for instance, was considered, whenever it was recorded, to be a change of some standing; and, to take another example, it is unlikely that more than a few inflammations of the lung happened to develop later than eight hours after calving.

The conditions listed above are recorded as circulatory changes, owing to their marked resultant effect on this physiological system. Two are very definitely and primarily circulatory in their characteristics, *viz.*, upset from accidental external causes including dystokia, and upset from vehicular transport. It is interesting to note that these last two changes occur in all cases prior to the frequently mentioned time limit for normal expulsion. Change in the general efficiency of circulation is capable of having a weakening effect on the mechanisms involved in placental expulsion. In the above observations this change has been markedly evident in at least 63 cases (20·9 per cent.) before the elapse of the time limit for normal expulsion. As explained above, the actual percentage may be appreciably higher. It is quite possible that many minor illnesses before calving pass unnoticed by the attendant and yet have a depressing or upsetting effect on the efficiency of parturition.

From the above considerations there seems some reason to form the tentative conclusion that retention of the placenta is fairly frequently a secondary condition. The primary pathological process may not always be capable of demonstration, and this does certainly apply to the many changes in blood and metabolism of pathological significance in the bovine.

Bacterial infection is responsible for practically all the serious pathological processes and changes associated with retention of the placenta in the bovine with the exception of such mechanical conditions as upset and resultant accidental prolapse of the uterus from mechanical irritation. The changes due to infection are essentially those of inflammation with its classical manifestations, and need not be followed here in much detail. There are, however, several special features which may be mentioned, as follows:—

Drainage of uterine discharges tends to be poor; there is frequently marked putrefaction of dead tissue within the uterus; some of the most severe types of inflammation are caused by septic contamination during operative procedures at calving or afterwards. The most dangerous secondary complications of the infected uterus are peritonitis with enteritis, and an inflammatory condition of joints and tendon sheaths. Indeed, in the writer's experience, the latter is one of the commonest causes of death in cattle practice. It is noticeable that heifers have markedly less resistance than cows to all the pathological processes connected with retained placenta.

Treatment

Correct treatment of any case of retained placenta presupposes careful consideration of the pathology. Where cattle are well managed and under favourable physiological conditions, the majority of cases of retention are likely to be of a fairly mild type, at least during the first two or three days *post partum*. There is probably little evidence of uterine inflammation, and only a limited amount of putrefaction in the dead placenta, and in the "decidua" over the cotyledons. Careful manual removal of dead tissue is indicated in these cases, for prolonged retention of decomposing infected material gives rise, in many cases, to metritis and vaginitis of various degrees of severity. There seems no contra-indication to the removal of dead tissues, under antiseptic conditions and without causing inflammation during the process. These two conditions are capable of almost full realisation, but possible bad results may to some extent be obviated by confining the operation of manual removal to cases where there is good contraction of the uterus and a certain amount of involution. This stage will frequently be reached about the second, third or fourth day after calving. Where there is very poor contraction and involution of the uterus, extensive manual removal of dead tissue may, however, not be contra-indicated. The prognosis in these extreme cases is not very favourable, whatever line of treatment is carried out.

As previously pointed out, inflammation in placenta and cotyledon may be a feature of the condition from the outset. In these cases manual interference is bad practice, unless it is obvious that there is a good local protective barrier in the cotyledon, with definite separation of dead tissue and placenta.

Severe metritis is frequently characterized by marked swelling of the uterus, the mucous membrane being friable and dry to the touch. In such a condition local manipulations are contra-indicated and aggravate the extreme severity of the condition.

In all cases, besides local treatment, the whole physiological condition of the animal should be kept at a high level, a platitude which requires no further emphasis here. Clinical changes are frequently observed in other physiological systems, apart from the genital (to the extent of 52 per cent. in the writer's cases), and these require due consideration.

A few of the drugs and two biological products used in the treatment of retained placenta are discussed briefly below.

Stimulants of Uterine Muscle

The efficiency of uterine muscle must depend greatly on general strength and nutrition, and under good physiological conditions there is a natural tendency for it to contract with diminution in size of the uterine cavity. Periods of rest supervene between periods of muscular activity, as can frequently be discovered during manual examination of the uterus.

As a stimulant to uterine muscle stilboestrol is known to have a positive action, but at least on theoretical grounds it is contra-indicated immediately after parturition. It causes increased congestion of the uterus and increased secretion, when the desideratum is an efficient circulation and a uterus decreasing in size. There is also the possibility of side effects from the action of stilboestrol causing disturbance of the ovarian cycle.

Pituitrin has a definite stimulant action on uterine muscle, but is fairly transient in its action and, used alone, has a very much reduced effect after the lapse of 24 hours *post partum*.[13]

Local Antiseptics.—Acriflavine and proflavine are known to exert an inhibiting effect on bacterial growth without causing tissue irritation, and should be used locally in low concentration. Suitable sulphonamides can similarly be employed, and in the case of both these types of antiseptic, they are best introduced in the form of a suitable pessary or similar non-irritant preparation.

Systemic Chemotherapy.—On their general reputation, it may be stated that the sulphonamides are of some benefit in diminishing uterine sepsis, and the risk of secondary complications in other physiological systems.

Summary

The incidence of retention of the placenta in the bovine is mentioned in American observations as being 11·7 per cent. (observations on 125 cattle for three years). The writer records a percentage of 8·3 (401 calvings). According to the reports of German and American workers, the disease is of considerable economic importance.

A study of the pathology within the first eight to twelve hours after calving is necessary for an understanding of the primary condition, infective processes later causing changes not associated with the aetiology.

From examination of 24 histological sections through cotyledons and the corresponding *retained* placenta, only one pathological change was observed in one section of placenta (*viz.*, necrosis with focal leucocytic infiltration). In all other sections there was no visible difference in structure from that found in 31 sections of normal cotyledon and placenta. The limit of time for normal expulsion of the placenta is considered to be eight hours or little longer after calving. It is recognized that a percentage of cases are associated with contagious abortion and other infective conditions. The difficulties in diagnosis of active brucellosis are discussed.

Various theories are quoted as to the mechanisms involved in expulsion of the placenta, but the writer is of opinion that there is still no definite proof on this point.

An analysis has been made of the results of the systematic clinical examination of 301 cases of retention. During the period of aetiological importance (prior to the time limit at which the placenta is normally expelled) clinical signs of marked circulatory change were observed in 20·9 per cent. of cases. These circulatory changes were sometimes the result of local pathological processes in other systems of the body but a good proportion were primarily circulatory in nature. The tentative suggestion is put forward that retention of the placenta in the bovine is frequently a secondary condition, secondary to pathological processes resulting in circulatory disturbance.

Reports on the analysis of 20 samples of blood from cases of retained placenta are given from the point of view of interest, but there are no significant changes in blood composition, on comparison with 37 normal samples.

Bacterial infection is the important factor in causing damage to the genital organs, and some clinical changes are mentioned of importance in practice.

In regard to treatment, it is emphasized that manual removal should usually be confined to cases where there is good contraction of the uterus and a certain amount of involution. This stage is frequently reached about the second, third or fourth day after calving. There seems no contra-indication to the removal of dead tissues under antiseptic conditions and without causing inflammation during the process.

In the management of cases of retained placenta, careful consideration must be given to clinical changes in other systems than the genital. These occurred in 52 per cent. of the writer's cases.

The action of several biological products and drugs, used in the treatment of this condition, is discussed but opinions on their use are largely orthodox and conservative.

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In conclusion, therefore, it is very necessary for the writer to thank sincerely all the above mentioned, who have so willingly helped him in this effort.

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Discussion

The Chairman called upon Mr. A. S. Chapman, M.R.C.V.S., of Kippen, Stirlingshire, as the first opener of the discussion.

Mr. Chapman: I would first of all like to thank Mr. Kennedy for such an excellent and scientific approach to a subject which, so far as I know, has had very little mention in veterinary literature. It is a subject which daily concerns the veterinary practitioner and one which does give him a considerable amount of worry. I propose, therefore, to deal with it mainly as it affects the practitioner.

Incidence.—I agree with the essayist when he says that less than 10 per cent. of cows retain the placenta. Mr. Kennedy makes no reference as to the time of the year when most cases occur, but I would say that the greatest number occur in early spring and fewer during the summer. This is probably due to the fact that there are fewer calvings, but probably also to the fact that animals calving on the grass cleanse more quickly. I think the condition less prevalent since the greater use of anti-abortion vaccine.

Economic Importance.—There can be no doubt that the condition is of great economic importance. As the essayist has quoted, a number of cases actually die and more than half the cases pass through an illness of varying degree. It is exceptional to find an animal that has retained the placenta to be milking and feeding well and normal in every way.

Animals intended for sale lose their bloom and are thereby reduced in value. The milk yield is less and there is always the possibility of subsequent endometritis and infertility.

Physiological expulsion of the placenta should occur within an hour or two of calving and should most certainly take place within eight hours. If it is not expelled within eight hours it is unlikely to be expelled for several days, unless manually removed.

Pathology.—The question is often asked by our clients—"What is the cause of retention of the placenta?"

I think there can be little doubt that the greater number of cases of retained placenta are met with in herds where clinical abortion exists. It also occurs in waves in a herd where clinical abortion does not exist and I think this points to infection of some other kind. Most dairy herds have now been vaccinated against abortion and I feel that blood testing is of little value in finding a cause. Some upset just before, at the time of, or soon after parturition is also a factor.

As the essayist points out, a considerable number of cases of twin pregnancy fail to expel the placenta. I would almost go so far as to say that retention follows almost all cases of twin pregnancy.

Dystokia is another common cause of retention.

C. pyogenes mastitis is often followed by the birth of a dead calf and a retained placenta.

I agree with the essayist when he says that retention of the placenta is a secondary condition and follows some upset, pathological, accidental or nutritional. I disagree, however, when he says that heifers have less resistance than cows to the pathological processes connected with retained placenta. It has been my experience that the heifer recovers more quickly than the cow of some age which has milked heavily. It is a remarkable fact that cows which are mostly out of doors and rearing calves seldom retain the placenta.

It is the treatment of retained placenta that most closely interests the veterinary practitioner and here we appear to have two schools of thought—those who say that it should be left alone and those who say that it should be manually removed.

The former group may find consolation in the fact that they never kill any animals nor endanger the patient's life but there can be no doubt that the animal loses condition rapidly, the milk yield falls, and it suffers a fairly long illness. The uterine contents become a septic, putrid mass and there is a copious evil-smelling discharge which takes months to clear up. Many farmers refuse to have their cows cleansed because they say that by leaving them alone they do not die and eventually make a good recovery. Occasionally, they say also, a cow which has been hand cleansed will develop septicaemia and die.

The second school appear to have different views as to when a cow should be cleansed. A few say that an attempt should be made to remove the placenta about 24 hours after parturition,

but I think a greater proportion favour an interval of two to three days after calving.

I am all in favour of hand removal of the placenta, but I like to judge each case on its merits. Only under exceptional circumstances would I attempt removal before the lapse of two or three days, *e.g.*, if a cow showed signs of everting the uterus or if there was a possibility of the *os uteri* closing and trapping the uterine contents.

The great majority of my clients only request the removal of the placenta about the third day and, generally speaking, I find this to be the most opportune time. On occasion one may find that at this time, especially if no placenta be visible externally, the *os uteri* has closed and nothing can be done. Most often, however, a portion of placenta protrudes through the *os uteri* and one is able to dilate the *os* gently and evacuate the uterine contents.

Even after the lapse of three days it may be found difficult or impossible to separate the placenta from the cotyledons without excessive damage to the cotyledons or leaving a portion of the placenta attached thereto, or there may be excessive haemorrhage. If this is encountered I find it safer to leave the operation for another two days to allow further separation to take place and ease the removal of the placenta. If more than two days elapse before revisiting the case one may find dilation of the *os* difficult.

On first visiting a case of retained placenta one can have a fair idea as to whether or not it will be removed easily. If a heavy mass of placenta be hanging it will generally be found easy to remove. If only a thin stringy portion hangs then the chances are that there will be some difficulty in removing it and the *os* will generally be found closed.

Removal of the placenta should only be attempted under strict antiseptic conditions and it is advisable that a bland antiseptic be used. If the uterine contents are in a healthy state and decomposition has not been rapid, removal will be easy and one need not expect further complications.

Often, however, the placenta has undergone rapid decomposition and a liquid, stringy mass is encountered. In those cases I take what solid material I can and scoop the liquid out with the hand. Syphoning the liquid off with a tube may be attempted but is often found difficult owing to the tube becoming blocked with fragments of placenta. Only sufficient water should be used to start the syphoning action as the introduction of further fluid into an atonic uterus is contra-indicated. It may be found helpful when syphoning to hold the cupped hand over the inlet to the tube and so prevent blockage with fragments of placenta. The operation may be completed by attempting to swab the uterus dry with sterile gauze.

If it is deemed advisable to revisit the case this should be done in 48 hours so that entrance may be gained to the uterus and the scooping-swabbing operation repeated.

The contra-indications of hand removal of the placenta are few but they do exist. If the uterus is flaccid and oedematous it may be advisable to leave well alone, for the prognosis in those cases will be poor and manipulation will only aggravate the condition. It is my view that in those cases it will be found more advisable to stimulate the physiological condition of the patient and attempt to stimulate uterine contractions.

Pituitrin has a stimulating effect on uterine muscle but as Mr. Kennedy has pointed out, its effects are transient and in my experience it has been of little value. On encountering a flaccid uterus containing much liquid I prefer to employ stilboestrol in doses of 30 to 50 mgm. and have on occasion repeated the dose in three or four days' time. Even this, however, is not constantly effective and must be supplemented by manual removal.

When the patient is toxic sulphanilamide per mouth may be found of great value as is the introduction of sulphanilamide and sulphapyridine into the uterus. These may be introduced in powder or pessary form. Antiseptics may also be of value and I am still a believer in iodoform pessaries as a deodorant after manual removal. Unfortunately, this drug taints the milk and the client should always be warned.

It is also to be hoped that the use of specifics against *C. pyogenes* infection will prove of value in reducing some of the unfortunate sequelae of retained placenta.

Mr. J. M. Rorrison (Derby), the second opener of the discussion, said: I wish, first of all, to thank Mr. Kennedy for the paper he has placed before us to-day and to congratulate him on its excellence and the very thorough manner in which he has carried out his many investigations. His many personal observations indicate his real interest in the subject and he must have given much of his valuable time to its study. I am, however, disappointed not to have heard more from him relating to treatment.

The subject is essentially a practitioner's one and I am sure it is treatment about which we want to hear most.

The incidence of retention of the placenta is given as being about 8 per cent. This is a high figure but, not having kept any records, I am not qualified to dwell on this point.

The condition is undoubtedly of considerable economic importance as affected cows almost invariably suffer a systemic disturbance of varied severity and length which leads to loss of condition and a reduced milk yield.

The aetiology, I am afraid, is complex in many cases and not thoroughly understood. In my opinion, the main factor controlling separation of the placenta is adequate contraction of the cotyledons. Contraction of the uterine wall expels the placenta once it is separated but, in my view, no amount of uterine contraction by itself, in the bovine, can produce separation and expulsion. Gravity must also play a part in aiding expulsion once the act has commenced. Evidence that contraction of the cotyledons is the primary step is often encountered when a "healthy" dead foetus is delivered (I here refer to those cases where labour has been long, due to dystokia). The placenta follows the calf out and obviously had been separated before the birth, and, consequently, before there was any appreciable reduction in size of the uterus. Examination of the cotyledons in such a case shows them to be relatively small compared with those that can be felt after a normal birth. The factor controlling contraction of the cotyledons is not to my knowledge understood. It may simply be that their high vascularity quickly reduces following a break in the foetal circulation either by rupture of the cord or cessation of the foetal heart.

Inflammatory reaction, in my opinion, is the commonest factor preventing contraction of the cotyledons and consequently causing retention of the placenta. I wish to mention here—and would ask Mr. Kennedy if he has noticed—that in many cases of retention the placenta is thinner than normal. I often find it possible, when making a uterine examination following calving a cow, to express an opinion, from the feel of the placenta, as to whether she will cleanse or not.

The frequency of retention of one placenta in cows producing twins is worthy of mention and difficult to explain. The separation of one is usually perfect and complete; the other has not even commenced to separate. The aetiology is difficult to explain but again may be associated with entrance of bacterial infection as the act of parturition in these cases is certainly of longer duration than usual.

Mention must also be made of those cases where separation is complete but where blood vessels of the placenta become caught round a cotyledon, preventing complete expulsion. I always think it wise, when such a case is encountered, to explain to the farmer that if on future occasions he notices the bulk of the placenta hanging he would do well to seek assistance early as in such cases there is an unnecessary risk of a metritis or even eversion.

Members of the farming community, I am sorry to say, consider removal of the placenta in the bovine a very simple, easy task for the veterinarian—and one not attended with much risk to the patient. Some consider it simple enough to do it themselves. I, and I think you will agree, consider it one of the most difficult, apart from being unpleasant, tasks we are asked to correct.

No set rules relating to (*a*) best time for removal, or (*b*) best form of treatment can be adhered to. Each case must be carefully examined and dealt with according to conditions encountered in the uterus.

To remove the foetal membranes before at least the third day is, in my experience, bad practice. Until at least the third day I find it impossible to determine, by manual examination of the uterus, the extent and type of infection. If removal is carried out and an existing infection supervenes you are left with a very sick cow in five or six days and one can do very little, at least locally, to counteract the very acute metritis. The *os* rapidly closes as soon as the placenta lying in it is removed and what virtually is a large abscess develops. Peritonitis, arthritis or a septicaemia referred to by Mr. Kennedy are frequent secondary complications encountered in these cases.

From an examination on the third day it is usually possible with some degree of accuracy to forecast what is likely to happen during the separation. When separation without sloughing is going to take place the uterus contains a slimy fluid, the uterine mucosa does not feel inflamed and the cotyledons are smallish and not tense. When the fluid content is watery, has a characteristic sickly clinging smell, and the cotyledons are enlarged and tense, sloughing is sure to take place. In such cases we usually find varying degrees of inflammation of the mucosa. The membranes may be removed without producing much systemic disturbance from the first-mentioned type but I wish to point out that if there is any difficulty experienced in separating the placenta it is better to leave them. Manipulation for lengthy periods in the uterus is, in my opinion, contra-indicated as damage results from every movement of the hand, no matter how gentle one tries to be.

Whether the placenta is removed or not, I always make a point of introducing into the uterus sulphanilamide or sulphapyridine 2 oz. mixed in one pint of whale oil plus a small quantity of water. These are mixed in a bucket and are emulsified when introduced into the uterus through a stomach pump and tube.

Similar treatment is given to those cases in which sloughing has obviously to take place, and a further examination carried out after 48 hours. The necrotic cotyledons usually slough, or can easily, by manipulation, be made to slough, about the sixth day, and the placenta, together with all necrotic material, can be removed easily. Douching two or three times with a weak tepid Dettol solution is advantageous. Douching and draining is carried out, using a stomach pump and tube, and sulphanilamide or sulphapyridine in oil is again introduced.

In a few cases it is impossible to introduce the hand into the uterus. In these cases it is possible about the seventh day gradually to work the placenta through the *os uteri*, not by simply pulling the whole mass, but by gradually guiding a small part at a time through with the use of one finger.

Flushing of the uterus in these cases must be carried out with care, only a small quantity of fluid being introduced. This care is necessary as, often in these cases, the uterine wall is inflamed, friable and can rupture easily if too much fluid is introduced. There is no danger of rupture of the uterine wall from too great a pressure of fluid if the hand can be introduced, as the response of the uterine wall to the fluid can be felt by the hand.

A third type of case is occasionally encountered in which the placenta appears to be rapidly liquefying. In these cases I do not advise the introduction of the usual antiseptic unless there is alarming systemic disturbance. The antiseptic would tend to delay the liquefying and prolong the case. It is best to examine again in two days and syphon off collected fluid.

Should any systemic disturbance be present as a result of metritis I find it wise to give sulphanilamide or sulphapyridine *per os* to aid the local treatment and minimize the possibility of septicaemia and other secondary complications already mentioned. A piece of rock salt or a salt lick is always advised and is much appreciated by the affected animal. I have not found stilboestrol to be of any value in the treatment of retention of the placenta.

Penicillin solution introduced into the uterus is reported to be of great value in acute metritis. I have not, however, used it in a sufficient number of cases to justify expression of an opinion.

General Discussion

Mr. John Adamson, Junior (Bolton): This was the first time he had attended a Congress and he hoped it would not be considered presumptuous if he inflicted a few remarks upon the audience, but he thought they gained very considerable knowledge from these gatherings. It was only by ventilating opinions that they could learn from one another. He would add his thanks to that of the openers of the discussion for a paper on what one could only consider to be a neglected subject. The paper showed that the profession had, as a whole, only a vague knowledge of the subject under discussion.

He perhaps had unorthodox views on the subject. He expressed these to an Association meeting in North Wales some years ago and caused a little flutter in the dovecote; in fact there was only one member who expressed his agreement with these views at that time. He would describe the method he had adopted in dealing with these cases, and many people might be surprised when he said he had not removed an afterbirth manually for about four years, but would hasten to add that this was not because he had not had the opportunity of doing so.

He practised in an area which was regarded as an intensive dairying district and the method he had adopted was to visit the patient between 48 and 72 hours *post-partum* and if the afterbirth was retained he carried out a manual examination, and unless the placenta was very easily detached, administered 20 to 30 mgm. stilboestrol intramuscularly; so far he had not had any of the untoward effects sometimes experienced after stilboestrol, although the method had been used in some hundreds of cases. A capsule containing 1 oz. sulphanilamide or ½ oz. sulphanilamide and ½ oz. sulphapyridine mixed together was introduced in the uterus. If the afterbirth was not expelled—and in five out of six cases it was expelled naturally some time between the third and the eighth day after calving—it was removed manually on the ninth day and he found that it was not necessary to introduce the hand into the uterus at all, but by grasping the placenta inside the vagina and using gentle traction it could be removed in one piece. Since he had used this method he had only had one fatality: a cow had died of septicaemia five days after calving.

One of the previous speakers mentioned *Corynebacterium pyogenes* toxoid, but in his opinion it was of no value whatsoever in these cases. In fact, he doubted its value at all in bovine practice.

Mr. Kennedy did not mention in his paper any method which might be adopted for the prevention of this condition in cattle, and perhaps he could give his views on that aspect. Also, there was a condition which he thought was much more prevalent in bovine practice than many realized, and that was tuberculosis of the uterus, and he would give a word of warning to the operator of the danger in dealing with these cases of contracting skin tuberculosis, on the hands and arms. There was a very real danger of this.

If there was any suspicion of a tuberculous infection, although it might seem to be going to rather a lot of trouble, it was much safer to prepare vaginal smears and examine them for acid-fast organisms before attempting a manual examination. Every care should be taken in dealing with this type of case which, of course, was now notifiable and could be dealt with under the Tuberculosis Order, and was probably the most dangerous, dissemination of infection being much greater in these cases than in an open lung case.

He apologized for that meagre contribution to the discussion, but having started the ball rolling he had not the slightest doubt that it was going to get a really good kicking about.

Mr. J. P. Cook (Market Weighton): It had not been his intention to say anything at that particular moment, but the last speaker had voiced his own sentiments and also said that he had had no support for five years, and he felt that he should not allow the moment to pass because he was almost right.

He did not intend to speak on the aetiology of the condition but would draw attention to one rather significant thing, and that was the rhythmic process which took place during parturition; it was all one continuous movement and if interfered with, in nine cases out of ten such interference would lead to complete interruption of the process. In a mare there was very seldom retention if she was left in the field, but if the anxious owner went out after her and brought her home, nearly always there was retention. If at any point during parturition the process was held up the whole thing was delayed.

The really vexed question was treatment. He would dismiss retention in the bovine in three words: "Leave it alone."

He had gone to the trouble of weighing milk at frequent intervals when cows retained the afterbirth and the results had been remarkable.

He remembered during his days on a farm, when a cow retained the afterbirth the local veterinary surgeon was called in to remove it about the third day. The result usually was that for that lactation that cow was wasted. If, as happened occasionally, the afterbirth was left almost intact in the uterus, the foetus having been delivered it would remain aseptic for a considerable period. When it came away, six to nine days later, it was still in a remarkably healthy state.

Any introduction of the hand at any stage during the retention of the afterbirth was contra-indicated; it was bad practice and should not be done. It abraded the surface of the vagina and more infection than ever was introduced. If it was necessary to gain a little knowledge a rectal examination should be made; otherwise leave it alone.

The uterus was big and would remain big, but as a rule it would contract and further contract until at the end of eight or nine days it was comparatively small. It was like a fortress where the defence had contracted to close up the weaknesses and to try to reopen it was to cause trouble to the cow. The animal should be given every attention. It should be kept warm and in good hygienic condition. It should be given the attention which might be required afterwards when there was a possibility of difficulty in getting it into calf again.

That, however, was not the point he was trying to emphasize at the moment, which was: "Leave the cow alone, do not introduce the hand at all." It might not be quite such spectacular treatment, but one would have a cow which would recover.

Mr. S. W. Woon (Kendal): Much had been said about lack of knowledge of the aetiology of the retention of the placenta. There was one point to which he had given a lot of thought and of which no mention had been made. Was it not a fact that the maternal instinct of most of the dairy cattle was very low? How often did they see a cow turn away from the calf immediately the parturition process was over? One did not come across the retained placenta in normal domestic animals. One speaker spoke about a mare—if there was interference of any kind there were far more cases of retained placenta than in normal parturition in the fields. There was the effect or non-effect of spinal anaesthesia on retention of the placenta. After the use of spinal anaesthesia there was no interference with the normal process. He would like Mr. Kennedy to state whether in anaesthesia of

moderate duration he had had any experience of retention of the placenta.

Mr. Rorrison had said that he had no use for the employment of stilboestrol in the retention of the afterbirth. The only use the speaker had for the administration of stilboestrol was when a leucorrhoea developed and if this was tackled with stilboestrol the number of cases of sterility resulting from retained placenta was materially reduced.

Mr. J. L. Linzell (Edinburgh): Mr. Kennedy was to be congratulated on tackling an important problem in such a comprehensive manner and his paper illustrated that the clinician who kept careful records could render the profession great service and lay the foundation for scientific progress.

The short résumé of the normal anatomy and physiology of the bovine gravid uterus would have benefited from a greater emphasis on the morphology of the placenta, which had been extensively studied by Assheton, R. (*Phil. Trans. Roy. Soc.*, London, B. (1906.) **198**. 143) and Mossman, H. W. (1937.) (*Carnegie Inst. Contra. Emb.* **26**. 129). It was also pertinent to point out that the syndesmochorial placenta (Grosser, 1927) was only found in some of the Order Ungulata and that in this respect the ruminants differed from all other domesticated species.

He also found it difficult to understand how uterine contraction, which could only approximate the cotyledons, could possibly aid placental detachment. At best it would merely aid the expulsion of the detached membranes. He thought it was faulty to apply findings from the bitch to the bovine, because the former had a totally different form of placentation.

He would also like to ask Mr. Rorrison by what mechanism he considered the cotyledons contracted, in view of the fact that histological studies demonstrated the absence of muscle tissue in these structures. Perhaps he had some vascular mechanism in mind?

He was disappointed that no reference was made to the writings of W. L. Williams, whose book "The Diseases of the Genital Organs of the Domestic Animals," was one of the speaker's "Bibles" during his clinical years at College. Williams made very important statements based on exceptionally complete records of herds under his care and he was hoping that Mr. Kennedy would have been able, from his experience and recorded data, to confirm or refute some of the bold conclusions drawn by Williams from his findings.

Did Mr. Kennedy, for example, agree that "retention of the placenta in dairy cattle was largely preventible by the application of conservative methods of breeding, feeding and handling?" Surely this statement, if substantiated, was of supreme importance, and merited more attention than the form of routine treatment to be adopted once the disease had occurred and which he rightly pointed out must in any event vary from case to case.

Williams asserted that in his experience retention could be associated with a particular bull and that breeding cows 30 to 60 days *post-partum* was conducive of the disease. He also found that a higher percentage of cases had a gestation period outside the normal limit of 279 to 288 days inclusive. He was sorry that Mr. Kennedy and other clinicians in this country had apparently ignored these questions because it was only the practitioner who could answer them.

He would also like to know what Mr. Kennedy considered the normal method of dehiscence to be. Was it progressive and, if so, did it commence at the cervical or ovarian end of the uterus? Did he notice any departure from normal in the cases of retention he studied? Was uterine atony present in his cases and did he consider it primary or secondary?

Mr. Kennedy agreed with other writers when he noted the association between premature birth and twin pregnancy with placental retention, but he was afraid he did not wholly understand his classification of associated disease findings, particularly those classified under the circulatory system. He frankly admitted that he did not know what Mr. Kennedy meant by an acute or subacute upset of the circulatory system. How did he detect these conditions?

Although Mr. Kennedy made no reference to prognosis he would like to know whether he considered a cow would breed again after total loss of the uterine caruncles which occasionally came away with the placenta. As a student he was led to believe that the cow was permanently sterile after this catastrophe, but when, in practice, he was presented with a cow 14 days *post-partum* after a twin pregnancy, in which he found both sets of foetal membranes lying loose in the uterus, the mucosa of which was quite smooth, subsequent examination revealing that every maternal cotyledon had been lost, he confidently predicted that the cow would be sterile. But his employer quickly and firmly told him that such cases frequently bred afterwards. Was this Mr. Kennedy's experience and if so, did he consider that the caruncles regenerated or that inter-cotyledonary placentation was capable of sustaining the development of a normal foetus?

The important article by Vinattieri, Hayward & Artioli (*Vet Rec.* (1945.) **57.** 509) did not appear to have attracted the attention which it deserved. It was clearly shown in well-controlled field experiments that in the Indian buffalo weaning the calf at birth resulted in a higher incidence of retained placenta and its sequelae than when the calf was allowed to suckle for four days. Mr. Kennedy did not appear to have investigated this important observation but he would be glad to hear his personal opinion on the matter.

Mr. M. A. Carmichael (Edinburgh): The idea of some of the the speakers that it was possible to treat every case of retained placenta as an individual case was not practicable in a widespread practice. One must lay down general principles for the guidance of the farmer as to when he should call in the veterinary surgeon, so that one had the best chance of removing the placenta. At one time he cleaned most cases three or four days after calving. He did not like it, it was a smelly job and he found considerable difficulty in getting his hand into the uterus at all, and latterly he had asked the farmer to let him know after the cow had hung for 24 hours and he tried to do the job before 48 hours had elapsed. He had been comparatively successful. One found quite a number of cases which were very stiff to cleanse between 24 and 48 hours, but having left a fair number of them for another day or two he had never found it easier to cleanse after the further period, so he came to the conclusion that if they were visited at 48 hours he might as well do the job. He had been successful except in cases where there was infection. After three, four or five days of retained placenta the damage was done in any case. The womb was infected whether someone had put his hand in the uterus or not. If it was left for four or five days it would be as well not to interfere with the cleansing at all. He was afraid he did not always agree with the previous speakers on that point. If the womb was already septic and the whole afterbirth was becoming a liquefying and suppurating mass, one had a good going metritis and the animal must be treated with sulphanilamide. The uterus would continue to secrete a lot of septic discharge for a considerable period.

On the question of after-treatment he said that having removed the placenta he had at one time great ideas of flushing out with Dettol and other antiseptic solutions, but he came to the conclusion that he was increasing the absorption of toxins. The uterus did not contract in the normal manner, the vagina became leathery and unpleasant to the touch, and the toxicity seemed to carry on for a considerable period. Latterly he had proceeded to treatment by sulphanilamide by mouth and the use of a proprietary preparation (Isovacuil) which he had found of value in getting rid of discharges. It was advertised to remove the placenta and he would be interested to know the experiences of other people. He had found that it did not with certainty remove the placenta, probably it would have come away anyway in cases which showed good results, but he had found it useful for after-treatment of cases where the placenta was removed by hand, for the expulsion of discharges and septic material. He would like to know what Mr. Kennedy, Mr. Chapman and Mr. Rorrison thought of this preparation.

Dr. O. V. Gunning (Acle): There was a condition which had not been mentioned. In addition to the cleansing there was an accumulation of fluid in the uterus. The cow was off her feed, she often had a high temperature and scoured badly. It was his opinion that the accumulation of fluid in the uterus caused the trouble. The only way of dealing with these cases was to syphon out the fluid. This might require doing for several successive days before the uterus contracted and the animal was on her feed again. He did not understand how people who never removed a cleansing dealt with that class of case.

Professor J. G. Wright (Liverpool): He was prompted to add to the discussion by the remarks of Dr. Gunning. In considering the management of retention of the foetal membranes in the bovine, he thought they should differentiate between those cases which followed normal delivery of the foetus and those associated with a long-protracted assisted labour. He did not think the same treatment was applicable to both and he had gathered that the cases in which Mr. Adamson and Mr. Cook recommended no manual interference were those which followed unassisted delivery. He must say that he was in entire agreement with them. During the past five years he had adopted the same attitude—no interference with retention in relation to normal parturition—and taking temperature records and milk yields as the indication, the animals concerned had apparently suffered no greater ill-health as the result of the membranes being left than was the case previously when he had removed them. In fact, he was of the opinion that manual removal constituted the greater risk. His own view was, and here he was entirely in agreement with Mr. Linzell, that this problem

must be studied primarily from the psychological rather than the physiological angle. Why was it that a cow, after a relatively normal labour, did not complete the process and expel the foetal membranes? Did psychological factors play a part? Undoubtedly lactation and suckling had a profound effect on the uterus and he was glad that Mr. Linzell had drawn attention to the work of the Indians who showed that there was a considerable reduction in the retention cases when the calf was allowed to suckle freely during the first four days. Parturition was a time when the animal's environment should be as near the natural one as possible. A point that interested him both in the mare and in the cow was that when the membranes were expelled normally they were inverted during the process of expulsion. He thought that fact tended to clear up the point made by Mr. Linzell as to where uterine contraction commenced. Quite clearly, if the membranes were to be expelled inverted, contraction must commence at the apex of the gravid cornu and that inversion having commenced, under the influence of progressive uterine contraction, it went on to completion.

Thinking on these lines also gave an indication as to the aetiology of prolapse of the uterus, a disorder which he believed to be intimately associated with expulsion of the foetal membranes, for should the apex of the uterus become inverted at the same time it was likely that the whole uterus would then undergo the process. Like Mr. Linzell, he had studied W. L. Williams but he could not accept the view that retention was predetermined by preparturient infection of the uterus. He believed that the uterus in the great majority of pregnancies was perfectly healthy up to the time of parturition. In saying this of course he accepted those specific infections of the endometrium—*Brucella abortus* and tuberculosis. A point that interested him greatly was—where did the bacteria which infected the foetal membranes come from? Did they invade from the vulva, progressively passing forwards into the uterus as they multiplied? Or did they arrive at the uterus from endogenous sources, the retained membranes acting as a foreign body which favoured their multiplication? It was a line of thought worthy of consideration. They had evidence that functional disturbance of the endometrium, especially that which resulted from ovarian dysfunction, rendered it prone to invasion by pyogenic organisms and also that when that dysfunction was overcome, the uterus was capable of resolution. A remarkable feature of the bovine endometrium was the resistance it afforded to the absorption of toxins. Stilboestrol in the treatment of retention had been spoken of highly by some and with scepticism by others. He felt that stilboestrol was a drug which should not be used indiscriminately for it was capable of doing harm. They must ask themselves, how might stilboestrol act in cases of retention? He believed its use had arisen from the fact that in certain cases of mummified foetus *in utero* and in certain cases also of pyometra, an injection of the drug caused emptying of the uterus and thus it might be expected to cause expulsion of the foetal membranes. As he understood the matter, however, the retention of a normal foetus, a mummified foetus or of pus was largely dependent on the presence in an ovary of a functioning corpus luteum and that the action of stilboestrol was to cause that structure to regress, thereby removing its progesterone influence. By this removal the uterine musculature became susceptible to the oxytoxic factor of the posterior pituitary hormone and the cervix relaxed. But in the parturient animal the corpus luteum had already ceased to function and the musculature had already responded to the whipping action of the pituitary and thus it seemed illogical to use stilboestrol. At any rate the advocates of the agent should assess their results with the greatest care.

Mr. E. P. Barrett (Guildford) wished to mention two minor points. The first referred to the type of case where there had been no appearance of the foetal membranes at the vulva, yet they had become detached. The detached membranes became jammed in the contracting neck of the uterus, thus acting like a cork in a bottle, preventing all drainage of the accumulating fluids. In this type of case, which he had met on a few occasions, he felt that the disciples of non-interference would have a dead cow in due course. Manual removal of the membranes, Mr. Barrett believed, was essential to recovery.

His other point was that he would like to ask if there was any accurate information on the bacterial flora of the uterus; and whether in fact sulphanilamide or any other of the sulphonamides could very much influence a septic condition in which apparently *Corynebacterium pyogenes* was the usual causal organism and which was not sulphonamide-sensitive.

Possibly there were also streptococci involved which would be influenced, but he would like to know whether the writer of the paper could give any information on that point.

THE REPLY

Mr. Kennedy, in reply, expressed his appreciation of the way in which members had studied the paper; he appreciated also the willingness with which they had discussed it, and it now remained for him to answer as concisely as possible the problems which had been brought forward.

Mr. Chapman agreed with him to a very large extent; he asked if the time of year made any difference to the incidence of retention of the placenta. He had no figures in that connection. It must be remembered that most calvings occurred in many districts in March and April, and naturally there were more retentions at that time of the year. Mr. Chapman also stated that infection, apart from abortion, was a common cause. One must know something about the state of the uterus within eight to twelve hours after parturition before much could be said in that connection. He had no figures about heifers having less resistance; but he had instinctively felt, when he tackled a case of retention of the placenta in a heifer, that the results would be likely to be worse than in the case of an older cow, which had probably attained a good level of natural resistance after a year or two of exposure in the dairy byre. It was very interesting to hear the arguments for removal or non-removal of the placenta. He would very much prefer to "leave it alone," but he liked to do the best he could for his client, and he did not think, from his own personal experience, he could agree with leaving a placenta alone. He liked to have a local examination at any rate. One never knew what one might find in a cow and it was advisable to look for another calf; sometimes there was a possibility of there being two. He was now to some extent answering Mr. Cook's criticism. Certainly the less manual manipulation in the uterus the better, but one could not go wrong in removing dead tissue without damage to the maternal organs; therefore it was inadvisable to carry out any prolonged manipulation such as swabbing with sterile gauze.

Mr. Rorrison had brought out some very practical points. One interesting point he discussed was the cause of expulsion of the placenta, and he stated that it was likely to be due to contraction of the cotyledons. He did not know that there was any muscle in the cotyledons. It would be interesting to find out. In looking at sections the pathologists had not been able to discover any, and he thought he was right in saying that muscles in the cotyledons were not mentioned in the literature. It was difficult to prove just why the placenta was expelled and what part the cotyledons might have in connection with it. Mr. Rorrison stated that inflammatory conditions were common causes of retention of the placenta, a statement difficult to substantiate. The placenta was often thinner than normal in cases of retention. Removal before the third day was not always bad practice. Remember the rules: remove dead tissue without causing damage to the maternal organs. If this was remembered the practitioner would come to a correct decision as to what to do. They should try to think generally and understand general principles.

Mr. Adamson's criticism was very interesting, as was Mr. Cook's. It was quite well known that many cows did quite well if the placenta was left inside without interference, but several speakers had pointed out the importance of at least one local examination. One could have *opinions* about the success of treatment, but one must take into consideration the health of the cow during the first weeks after parturition, and the amount of milk she gave during the next lactation. One must consider further how she had bred in the next two or three years. If any members had complete records of how cows had fared in these respects (and he would like to know about a large number of cases) and they could let him have them, he would be delighted. Treatment must be judged in accordance with the results in a cow over several years.

In regard to prevention of retention of the placenta, that meant studying the aetiology much more than in the past. Personally he had found a lot of pathological changes and clinical signs in other physiological systems than the genital, and it was only reasonable to assume that these were closely associated with the aetiology. That was all the contribution he could make with regard to causes of retention, but what was needed in the profession both in regard to retention of the placenta and a hundred and one other problems, was accurate records of numbers of cases. He thought they owed it to their fellow practitioners to make some attempt to record their observations of something of importance and interest in their own practice.

Mr. Wood's point was interesting. Some cattle had a strong natural instinct because they were not much handled. Spinal anaesthesia did not seem to have much effect on expulsion of the placenta. Mr. Linzell was very interesting; it would take some time to reply to his criticisms. He asked how the cotyledons contracted, but he did not think that contraction of the cotyledons

was mentioned in the paper. What he would like was a number of accurate records, without too much personal theory. For instance, he thought that Hammond, in his book, "Reproduction in the Cow," was very sound. He had handled a number of cases very carefully and got the maximum amount of information from them. A longer gestation period had not any effect on the retention of the placenta as far as he had noticed. What did he mean by acute or subacute upset of circulation? Those who examined cows carefully, looking out for everything, did find big changes in pulse and in respiration, etc., and had come to the conclusion that there was quite a lot of circulatory upset; it was accordingly noted as being associated with retention of the placenta. Cows would breed quite successfully, after loss of the cotyledons. He was very sorry that in the limited time at his disposal in preparing this paper he could not discover his copy of *The Veterinary Record* which contained an article describing retention of placenta in the buffalo, because it would have contributed something valuable to this paper.

He agreed with Mr. Carmichael that after retention of four, five or six days, there was not so much point in removal. Most of the preparations which were advertised to cause removal of the placenta were preparations of stilboestrol. He did not find it useful and thought it had been slightly detrimental in the treatment of some of his cases.

Dr. Gunning brought forward a very practical point—how to treat the case where there was a large accumulation of fluid in the uterus. He thought the best idea was to syphon the fluid off in a sterile manner without disturbing the cow too much.

He knew Professor Wright's interest in retention of the placenta from his writings, and he was glad to hear that he had some temperature records showing the results of leaving the placenta alone, but records for two years were wanted. They wanted to know about the breeding history of the cow for a long time afterwards; that was the way to come to some opinion as to the results of treatment of retention.

Psychological factors might be important. He had noted that, after transport, cattle were very liable to retain the placenta. Mechanical transport nowadays caused a lot of psychological upset as well as a certain amount of physical upset; he quite agreed with Professor Wright that early pathological changes were not likely to be present in many cases of retention of the placenta.

Whence came infection? As a practitioner he could only say that he was a little puzzled, but it always came along.

Mr. Barrett asked how to treat a case where there was a lot of fluid in the uterus. Syphoning was the only way to deal with the problem. The study of the bacterial flora of the uterus was quite a big job and it was difficult to know which were doing the damage in retention of the placenta, because there must be a huge variety of organisms. He was very sorry to have to plead ignorance on this matter. As to the use of sulphonamides, he did not think they were miraculous in their effect, but one did know that they inhibited the growth of, and killed certain organisms, and for that reason, to give the animal the best possible chance, one should give judicious doses of sulphanilamide or "693."

He had come to the end of the very interesting criticisms, and could only thank his hearers once again for their great patience and the interest they had shown in the subject.

INTERNATIONAL CONGRESS OF ZOOLOGY, 1948

The Executive Committee of the Thirteenth International Congress of Zoology has announced that the Congress will be held in Paris during July 21st to 27th, 1948. An attempt was made to arrange that the two Congresses, of Genetics and of Entomology, to be held in Stockholm in July and August, 1948, respectively, should be brought close together so that the Congress of Zoology could either precede or follow them, but this proved impossible. The Congress of Zoology will meet in the following sections, the sectional presidents' names being given in brackets: General Zoology (Professor A. Vandel); Evolution and Genetics (G. Teissier); Cytology and Protistology (Professor E. Fauré-Frémiet); Comparative and Experimental Embryology (E. Wolff); Vertebrates (*a*) Comparative Anatomy (Professor M. Prenant) and (*b*) Systematics and Ecology (Professor E. Bourdelle); Invertebrates except Insects (Professor L. Fage); Entomology (Professor R. Jeannel); Applied Zoology and Parasitology (Professor A. Vayssière); Zoogeography and Palaeontology (Professor C. Arambourg); Nomenclature (M. Fischer-Piette). The President of the Congress will be Professor M. Caullery, Professor of Zoology at the Sorbonne. President of the Permanent Committee of the Congress of Zoology; and the Secretary-General is Professor Fischer-Piette, 55 rue de Buffon, Paris Ve., from whom particulars can be obtained.

CLINICAL COMMUNICATIONS

Penicillin in Bovine Practice

E. B. JONES, B.V.SC., M.R.C.V.S.,
BANGOR

Intramammary infusion of penicillin in confirmed cases of *Strept. agalactiae* mastitis in this practice has been somewhat disappointing. On perusal of the literature covering the use of penicillin in mastitis, it was found that the parenteral mode of administration was considered of no value; hence in this practice penicillin fell into disuse early after its release for veterinary work. However, it was noted that "so far as can be ascertained" animals could tolerate large doses, and it was decided to explore the parenteral mode of administration.

The first case on this line of treatment was a black Welsh heifer, milking well, which was found one morning with one swollen quarter. When examined (December 12th, 1946), the appetite was in abeyance, the temperature was 105° F., and the near hind quarter was markedly inflamed, with a blood-like, clotted secretion. Sulphanilamide therapy was resorted to, in addition to repeated bathing and stripping. On the 13th, a milk sample was confirmed as a *Staph. pyogenes* mastitis, and there was little improvement either of quarter or of general condition; 100,000 units penicillin in 20 c.c. of boiled water were administered intravenously. On December 14th, 100,000 units, dissolved in 20 c.c. boiled water, were infused into the quarter; similarly, on the 15th and 16th, when the temperature was 102·5° F., the lowest recorded. There was marked improvement in the general condition, and in the affected quarter, which was still hard, with thin, watery but not bloody, secretion.

On December 19th a Stinson's operation was performed aseptically, on the off hind teat of a healthy Roan Shorthorn cow, calved 36 hours previously. The quarter was drawing well with clean milk when left. Careful and clear instructions were given to the owner as to further treatment with teat bougies. On December 20th an urgent call was received to see this cow, which on examination presented a picture of acute septicaemia—groaning, recumbent, temperature 106·5° F.—arising from the grossly swollen, bluish coloured, operated quarter, from which issued a reddish, smelly secretion. The teat felt clammy and slightly emphysematous. Drastic treatment was deemed advisable, and the animal was given 100,000 units penicillin in 20 c.c. distilled water intravenously, and 50,000 units in 20 c.c. distilled water into the quarter. On the 21st the cow was markedly improved; she was eating, her temperature was 104° F., and the quarter less tender and swollen. Again 100,000 units were administered intravenously and 50,000 units into the quarter, and sulphanilamide was prescribed. On the 24th no elevation of temperature was recorded and the cow was eating well. The quarter was hard and of the same size as its partner and there was a little brownish secretion from the teat.

There is little doubt that the remarkable improvement shown in both the above cases, especially the latter, was entirely due to the intravenous therapy. On sulphanilamide alone recovery would have been protracted, with marked wasting of the patient and probably a knacker yard ending.

On December 27th I was summoned to see an Ayrshire cow. On examination the animal exhibited the symptoms of tetany and soon became recumbent. Calcium borogluconate was administered intravenously and magnesium sulphate subcutaneously. Twenty-four hours later the animal was up and eating, but the temperature was subnormal. Examination revealed clotted milk from both hind quarters, and the history was given that the animal had been treated with sulphanilamide before collapse. It was stated that as soon as the sulphanilamide dosing had commenced the cow had gone off food, scoured freely and had become uneasy and peculiar. It was believed that the sulphanilamide dosing had precipitated, if not actually caused, the tetany. One was very dubious about the desirability of administering sulphanilamide further for the still persistent mastitis, but as the animal had a subnormal temperature no mastitis treatment was adopted. On the 29th temperature was recorded as normal and 100,000 units penicillin in 20 c.c. distilled water were administered intravenously. This was repeated in 24 hours. Subsequent examination on the 31st revealed a clinical cure with no clotting or discoloration of the milk.

In the period January 1st to March 31st, 1947, ten cases of mastitis due to *Streptococcus agalactiae* have been treated by penicillin therapy intravenously, administering two injections of 100,000 units in from 5 to 20 c.c. distilled water at 24 to 48 hours' interval. These ten cows comprised newly calved cows showing clotted milk, and dry cows showing a chocolate secretion. All of these cases had bad histories: recurrent mastitis in previous lactations on sul-

phanilamide therapy and marked scouring and depression with slow recovery. To date only one of these cows has shown a recurrence, which responded to 9 ozs. of sulphanilamide. One other did not clear up entirely until two infusions of soluthiazole had been given. Altogether two cows have shown no improvement whatsoever after intravenous dosing of 100,000 to 300,000 units, in addition to udder infusions.

Three cases of mastitis due to *Corynebacterium pyogenes* have been treated with penicillin intravenously, with only one clinical cure. This was an Ayrshire cow showing a mild infection, which was confirmed by laboratory diagnosis. The affected quarter appeared to be kept in check by subcutaneous pyogenes toxoid injections repeated twice before calving. After calving, the milk was clear white except for the presence of hard cheese-like clots. This cow received 200,000 units penicillin intravenously twice at 24-hour interval, and when sold ten days later showed no clinical symptoms of mastitis.

Summary

1. Acute staphylococcal mastitis responds effectively to penicillin intravenously.

2. Penicillin intravenously in streptococcal mastitis is of considerable value, especially in cases associated with milk-fever-like symptoms, depression, scouring and recurrence which occur on sulphanilamide dosing.

3. Only one clinical cure in a *C. pyogenes* mastitis was obtained, and that in a mild infection.

Acknowledgments.—To A. Sutherland, Esq., M.R.C.V.S., Bangor, in whose practice this work was carried out.

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Penicillin in Small-Animal Practice

HAMILTON KIRK, M.R.C.V.S.

Case I

Over two years ago a cat was brought for treatment of chronic nasal catarrh which, apparently, had been the cause of an almost complete erosion of the nostrils, the septum and the alae nasi having been eaten away, giving the animal an appearance simulating syphilis in man. The cat was an absolute fiend to treat, and salivated pools of mucus at the mere sight of a bottle or a syringe. Almost every conceivable treatment was afforded from time to time, including anti-strep. vaccine, sulphathiazole, nasal irrigations, inhalations, local applications of gentian violet, and acriflavine. Usually some improvement was effected each time there was an exacerbation, and in June of this year the cat (now eight years of age) was brought again with profuse bilateral, nasal, mucoid discharge, and a general flare-up of the original condition. Streptococcic vaccine was administered in six doses over a period of three weeks and the cat returned home much better. At the end of July I was requested to attend it again in consequence of purulent conjunctivitis, nasal discharge, complete anorexia and great debility. Nonplussed as to what to do next, I did not wait for another bacteriological investigation, but decided to inject penicillin. Having in the car a bottle containing 100,000 units, I injected into it 6 c.c. of boiled water and gave the cat 2 c.c. (33,000 units) subcutaneously, and requested that further doses of 2 c.c. should be injected every three hours and, if improvement was shown, that another three doses should be purchased and injected. The owner was the proprietor of a nursing home, thus my requests were easily acceded to. After the first three doses I was telephoned to the effect that there was miraculous recovery. The cat ate a good meal (first feed for four days), was bright and happy, and the discharges were abating. There has been no relapse.

Case II

Another successful case was that of a four-months'-old valuable Siamese cat which came in showing typical symptoms of distemper. It had the usual profuse nasal and ocular discharges, temperature of 103°, anorexia and great dullness.

In this instance a dose of penicillin suspended in bees-wax, and equal to 50,000 units, was injected intramuscularly, followed 12 hours later by a similar dose. The next day the owner rang up to say the improvement was marvellous, cat feeding and playing, etc. The animal was not seen again and, presumably, recovered.

Case III

For eight days I have been treating a greyhound sapling with severe distemper, followed by pneumonia. Caniseran, non-specific vaccine therapy, sulphapyridine, etc., were all used, but one evening the dog was found to be extremely ill, weak, emaciated and gasping for breath.

Three doses of aqueous penicillin (33,000 units in 2 c.c.) were given subcutaneously every three hours up to midnight of that day, and instructions left that if any improvement at all was observed several further doses of 50,000 units should be administered. The dog being 30 miles away from the surgery, I could not give them personally, but the trainer was able to do so.

The report next morning was of wonderful improvement, and my instructions were to continue giving penicillin for a total of three days. This dog, which inevitably would have died, has now recovered. It is interesting to note that whilst intramuscular injections of the emulsion appear not to cause more than trifling discomfort, aqueous penicillin sodium salt, when so introduced, seems to be positively painful. The greyhound, at least, sharply resented it.

Case IV

A cocker spaniel which had been treated in the later stages of distemper, with a four-days' course of sulphathiazole, failed to throw off its remaining symptoms of purulent conjunctivitis, anorexia, and undulating temperature. Six doses of aqueous penicillin were administered subcutaneously at three-hourly intervals, each dose consisting of 33,000 units in 2 c.c. distilled water.

Appetite returned, temperature remained normal, but a previously noted hyperaesthesia did not abate until bromide had been administered for two days.

Remarks

Theoretically, of course, one should ascertain the type of organism present and chiefly responsible for the animal's illness, in order to know whether it is or is not penicillin sensitive. But this entails time and further journeys; so in practice it is found advisable to administer the penicillin without delay and be prepared to recognize the reason if no success results.

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Penicillin Therapy in a Toxic Bitch *

S. F. J. HODGMAN, M.R.C.V.S.,
Newmarket

Subject.—Eleven-year-old Spaniel bitch.

History.—Operated upon for pyometra five days previously while in a very depressed and comatose condition. Bronchial pneumonia developed shortly after the operation, probably due to the use of A.C.E. mixture to reinforce light nembutal anaesthesia. Penicillin was administered as a therapeutic measure in a dosage of 400,000 units per day given at four-hourly intervals.

Five days after the operation all the sutures in the abdominal wound burst during a fit of coughing and most of the viscera were extruded. This not uncommon complication of abdominal surgery in the dog was dealt with in the usual way by replacement of the viscera and re-suturing of the wound. The bitch proceeded to make a rapid and uninterrupted recovery.

Comment.—The interest of this case lies in the fact that an aged and already toxic bitch was able to make a rapid recovery both from the pneumonia and the evisceration, the latter always serious in itself, and it is suggested that this may have been due to the previously instituted penicillin therapy, which not only shortened the course of the bronchial pneumonia but probably prevented the development of peritonitis.

* "Case of Interest" related to the South-Eastern Division, N.V.M.A., at Frant, June 25th, 1947.

SCOTTISH MILK RECORDS POSTS

The Scottish Milk Records Association have appointed Mr. Neil M'Ewan, Stair House Farm, Mauchline, to be their assistant superintendent from October 1st. Three new supervisors have also been appointed: Mr. Samuel Campbell, Glasgow; Miss Nadine Robson, Northumberland; and Miss Cecilia Dodds, Selkirk.

They will take up their duties on November 1st, and will each have a region to supervise. The staff of supervisors being thus increased to six, there will be a suitable division of the regions. The Association now have 91 recorders working all over Scotland—the largest number they have ever had.

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Weekly Wisdom

The one certain thing about prevailing doctrines in a free country is that they never quite prevail.—Major Lewis Hastings ("Dragons are Extra").

ABSTRACTS

[The Future Control of Abattoirs and Knackeryards. BURROW, H. (Paper presented to the 1946 Congress of the Royal Sanitary Institute.) *J. Roy. San. Inst.* **67**. 95-99.]

In this paper Mr. Harold Burrow, M.R.C.V.S., D.V.S.M., points out that the important part that flesh and fat play in the nutrition of the human race makes the slaughterhouse from which these products become available an important keypoint in the feeding of the population. The scarcity of animal products which has followed the war has reminded us of our dependence on an adequate meat supply. The Ministry of Food, through Orders designed to control the purchase, slaughter and distribution of certain classes of meat, has a virtual monopoly of slaughtering of cattle, sheep and pigs in this country. There are approximately 600 slaughterhouses utilized by the Ministry of Food, leaving thousands of privately owned slaughterhouses idle. Sooner or later the future of these slaughterhouses must be decided upon and the time may be not far distant when emergency powers must give place to normal constitutional measures and slaughterhouses generally come again under the umbrella of the Food and Drugs Act, 1938, with its legacy of obligations from the Public Health Act, 1875, and the Towns Improvement Clauses Act of 1847.

Few will deny that centralization of slaughtering facilitates the inspection of meat, collection and processing of by-products. The public abattoir should not be regarded as a factory but as a place where each butcher may carry on his own slaughtering during regulated hours. Two types of users of the public abattoir of the future are envisaged—the wholesale meat trader, whose slaughtering is carried out by specialist slaughtermen, and the retailer, whose slaughtering would be carried out by himself or by some of his shop staff.

Shall local authorities be allowed to utilize the powers given them by the Food and Drugs Act to establish public abattoirs or shall the State be responsible? The record of local authorities in the provision of public abattoirs is not one of which they need feel ashamed and compares very favourably indeed with the far from hygienic or even business-like management now exercised by the State. Local authorities are vulnerable to criticism and remedial action if they fail in their duties; their administrators are local and accessible and their executive officers have a spirit of concern for the welfare of the community. The State, however, is impersonal, intangible and out of reach. Its executives, moved from pillar to post, often against their will, have little enthusiasm for schemes of improvement of value to the locality temporarily under their charge.

If we agree that local authorities are the right and proper bodies to control public abattoirs, through what officers should they exert their guiding power? It is obvious that in an establishment whose essential inmates are animals an understanding of animals is desirable. Such a manager may be a veterinary surgeon although it will be agreed that others are quite capable as administrators and business men. The veterinary profession, however, does claim to keep pace with such men in general and to have the background for the successful administration of a public abattoir. So with advantage the management may well be given to a veterinary surgeon. It is emphasized, however, that the veterinary profession does give place to no other profession or body in its ability to judge whether an animal either alive or dead is fit for human food. Neither medical nor sanitary officer can claim for himself any but a layman's part when compared with a veterinarian as an authority on live or dead animals and their products.

Both medical and sanitary officers have their collateral parts to play and it may be no less important that those who handle meat are as free from disease as the products they prepare. Nowhere will the sanitary inspector gain more praise than from the veterinary profession for his part in meat inspection provided that he has the good sense to "ape" neither the medical nor the veterinary officer. His knowledge and training generally, enhanced by his brief but special training as the right-hand man of the veterinary officer for meat inspection, render him a necessary and welcome member of any organized meat inspection team. The ideal team is that in which the medical man looking to his human subjects—the slaughterers and all who handle meat; the sanitary officer watching for the abnormal and unclean; the veterinary officer shouldering his responsibilities and his alone—the interpretation of abnormalities in both dead and live animals, all have their place.

Efficiency in the past has often been impaired by the unfortunate relationship between medical, veterinary and sanitary officers. In any future meat inspection service all must be capable of functioning as executive officers and the directors have nothing less than a full veterinary training.

Some may think that uniformity in meat inspection might in future be administered by the personnel of a Government department such as the Animal Health Branch of the Ministry of Agriculture. Can we say, or can it be claimed, that the Ministry has made progress or even maintained the standard obtained at the time of its intrusion into that field? Again, has the influence exerted by the Ministry of Food on local authorities' advisers on meat inspection in areas where its abattoirs are functioning done anything other than depress the standard of meat inspection in this country? The answer in both cases is "no."

Knackeryards as a whole are a disgrace to those who own them and to local authorities who condone their existence. The fact that no death certificates in respect of animals are insisted on by the community through its legal machinery means that such dangerous diseases as anthrax escape detection. Owners of dead stock are left in ignorance as to the real cause of death and are not in a position to take precautions to prevent similar losses. Knackeryards should be run as properly sited and equipped animal-disposal stations, where every animal could be examined *post-mortem*, and action taken to prevent its former contacts on the farm from suffering a similar fate. Local authorities, preferably on a county basis, should be responsible for the erection, maintenance and conduct of animal-disposal stations.

F. L.

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[Concentrations of Penicillin in the Bovine Mammary Gland following Infusion, and the Penicillin Tolerance of Certain Streptococci. THORP, W. T. S., UHRIK, I. J., and STRALEY, E. J. (1947.) *Amer. J. vet. Res.* **8**. 157.]

The authors have measured the penicillin levels in the bovine udder following infusion with different doses in varying amounts of diluent. Forty-five cows were infused in all quarters; five different doses in three amounts of diluent were tested. The doses employed were 200,000, 100,000, 50,000, 25,000 and 10,000 units in 100, 50 or 20 ml. of normal saline. The cows were selected in groups of three as nearly equal in lactation as possible. Assays for penicillin were made at two-hourly intervals for eight hours following infusion.

On the basis of these investigations 100 or 50 ml. of diluent appear to be the most satisfactory to use, depending on the stage of lactation. The greatest variations in penicillin levels were obtained with 20 ml. of diluent. In non-lactating cows penicillin remained in the gland for 48 hours in all quarters and in 75 per cent. of the quarters it persisted for 72 hours. The persistence of penicillin in quarters receiving 200 000 units was not significantly greater at eight hours than in those infused with 100,000 units.

In vitro sensitivity tests showed that enterococci (Lancefield's Group D) would tolerate at least 200 units per ml. of penicillin whereas *Strep. agalactiae* and *Strep. dysgalactiae* were not able to grow in the presence of one unit of penicillin per ml.

D. L. H.

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[The Resistance of Chronic Staphylococcic Bovine Mastitis to Massive Penicillin Therapy. MCCULLOCH, E. C. (1947.) *Amer. J. vet. Res.* **8**. 173.]

Ten quarters of seven cows chronically infected with *Staph. aureus* were treated with penicillin by infusion. The treatment comprised 100,000 units of penicillin per quarter in four infusions at twelve-hourly intervals. Only a temporary reduction in the number of staphylococci was achieved. There was no evidence of udder irritation following these infusions.

The author emphasizes that these cases were chronic and long-standing and the data does not necessarily apply to acute staphylococcal mastitis and certainly not to infections due to *Strep. agalactiae*.

D. L. H.

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specimens were received for naming and 6,347 specimens were distributed, principally to institutions at Kew, Pretoria, Oxford, Washington, London and New York. Short trials have thrown some light on the mechanism of soil erosion in certain areas.

"A general opportunity for experimental research is being provided in Kenya as part of the campaign against the world-wide shortage of vegetable oils. High-grade linseed has arrived from Canada and the Ministry of Food has appealed to farmers to grow this plant for the extraction of oil. It is hoped that up to 4,000 acres will be planted this year."

REVIEW

[**"The Artificial Insemination of Cattle."** By John Hammond, M.A., D.Sc., F.R.S. (Editor), J. Edwards, M.Sc., L. E. A. Rowson, M.R.C.V.S., and Arthur Walton, B.Sc., Ph.D., School of Agriculture, Cambridge. Published by W. Heffer & Sons, Ltd., Cambridge. Price 3s. 6d. net.]

This booklet is the joint product of a distinguished team of agricultural scientists working at Cambridge and of Rowson, a veterinary surgeon who has had great experience in the science and practical application of artificial insemination in dairy stock. It is emphasized in the preface that the object of the book is to assist those who may wish to use artificial insemination for the improvement of cattle. In this object it undoubtedly succeeds, being based upon sound and active practical experience gained at the Cambridge and District Cattle Breeders' Society's station.

Criticism might be levied at the inclusion in a book intended for the layman as well as the agricultural and veterinary scientist of the technique of pregnancy diagnosis, which is dealt with in a rather perfunctory manner in the text and in greater but insufficient detail to serve the uninitiated, in the appendix. The information, however, is such that it is obviously intended for the trained worker and the veterinarian.

The advice on page 25 "to hook the dividing line between the two horns of the uterus with the middle finger and easing it down by drawing the cervix over the end of the glass tube," may prove a little difficult and not without danger for many to follow in the field, and it would probably be more in accord with normal practice to have recommended that a fresh pipette and semen should be used where an accidental entry to the bladder had occurred at an initial attempt at insemination. The recommendation of a circular power-driven exerciser for bulls is interesting but does not appear to be warranted so far as its practical application in this country is concerned.

The sections dealing with bull selection and management are very good but could, with advantage, be elaborated in a future revised edition.

The book contains full and practical instruction in the whole of the organization of an artificial insemination centre, both technical and administrative: it is therefore of especial interest to veterinary surgeons acting as founder members or members of advisory committees.

AGRICULTURAL RESEARCH IN EAST AFRICA

In a recent announcement reviewing the above, the Colonial Office says: "The question of the reorganization of East African Agricultural Research was first raised officially at a Conference of Directors of Agriculture in 1940. At a conference in Nairobi in February, 1946, on Agricultural, Animal Health and Forestry Research in East Africa, at which representatives of the Colonial Agricultural Research Committee were present, it was finally decided that an East African Agriculture and Forestry Research Organization should be set up to replace the East African Agricultural Research Institute at Amani, Tanganyika. Land for a new central headquarters has been purchased in Limuru, Kenya, with the aid of a grant under the C.D. & W. Act. At the end of July last a further conference was held at Nairobi when reference was made, among other conclusions, to the need for (*a*) a fully equipped Central Field Experimental Station, (*b*) experiments on the use of artificial fertilizers, (*c*) wide-scale surveys of vegetation, soils, land utilization and social conditions, (*d*) research on pastures as part of the work of both the Agricultural and Veterinary Research Organizations, (*e*) a Flora of East Africa and a better scheme for plant quarantine. It was also announced that the first Director of the Agriculture and Forestry Research Organization will be Dr. B. A. Keen, F.R.S., who was for many years Assistant Director and Head of the Physics Department of Rothamstead.

"The setting up of the new Research Organization means that the 1946 Report (Col. No. 213) of the Agricultural Research Institute at Amani will be the last one of an organization which has carried out much valuable research work in East Africa, particularly during the war years. During 1946 Amani continued its research in soil science, plant pathology, plant physiology and systematic botany and also maintained plantations as in previous years. A soil map of Tanganyika was prepared and experiments were carried out on 'cultivated fallow.' Field trials have been laid down using silicophosphate manufactured in experimental quantities by the East African Industrial Research Board from phosphate deposits in Uganda and soda deposits in Kenya; 5,139 botanical

(*Concluded at foot of previous column*)

Questions and Answers

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Red-Worm Infestation in Unweaned Foals

Q. CCXVI.—*What is regarded as the best method of treatment for red-worm infestation in unweaned foals, having regard both to safety and ease of administration?*

A.—Phenothiazine is the anthelminthic of choice for red-worm infestation in horses of any age, and can safely be used for foals in doses of 15 to 20 gms. If a foal- or pony-size stomach tube is available, the drug is best administered by this route, but if for some reason the use of the stomach tube is impracticable, drenching may be resorted to. Administration in the food is unsatisfactory as many foals refuse to eat the medicated feed, and this method can only be used when mares and foals are separately fed.

Three and a half to four months is the earliest age at which treatment should be undertaken, and it must be borne in mind that the larger and more pathogenic redworms of the *Strongylus* spp. are not accessible to the action of phenothiazine until 6 to 12 months after the ingestion of the infective larvae, by which time they have completed their migrations and become established as mature adults in the large intestine. Dosing must therefore be repeated after weaning, and yearlings should be dosed in the spring if these more harmful parasites are to be eliminated.

Ethyl Oleate as a Vehicle for Penicillin

Q. CCXVII.—*What is the efficacy of ethyl oleate as a vehicle for penicillin?*

What must be the frequency of dosage? May it be given with advantage subcutaneously?

A.—Ethyl oleate and arachis oil, each in combination with beeswax, have been chosen as suitable vehicles in which to present penicillin for parenteral administration in the form of a suspension. While arachis oil is now official in the British Pharmacopoeia, advantages which may well be claimed for ethyl oleate are that being less viscous than arachis oil there is greater ease in manipulation, it can be inserted without previous warming, and is less likely to cause soreness at the site of injection.

Due to lack of published data on the blood levels reached, and the length of time for which they are maintained with the ethyl oleate preparation, it is not possible at this stage to make a dogmatic statement on which vehicle will be chosen eventually as being the most suitable in human and domestic animal practice. In experimental laboratory animals one worker has claimed superiority for arachis oil, stating that the drug incorporated in ethyl oleate maintained blood levels no more effectively than penicillin administered in aqueous solution.

More recently the evidence of another worker seems to place doubt on the earlier observation, but this in part may be explained by the employment of varying concentrations of penicillin. It is also important to emphasize that information available is based solely on results shown in rabbits under certain experimental conditions, and that to date we have no reliable guide obtained in clinical practice covering human patients or domestic animals.

In the present state of our knowledge, therefore, it would appear that ethyl oleate as a vehicle can be regarded as being just as suitable for this purpose as arachis oil, and that although the former is less viscous it has yet to be proved that this is a matter of paramount importance where the same penicillin dosage levels are being observed.

Regarding frequency of dosage, to maintain adequate inhibitory blood concentrations the factors of importance are the amount of penicillin given and the rate of absorption. In human clinical practice it is not uncommon to administer a large dose of penicillin in aqueous solution to ensure the most rapid blood level, and to maintain this by smaller doses of an oil-wax preparation, the latter being given once or twice in 24 hours. In human practice, owing to the delay in absorption with subcutaneous administration, penicillin in oil-wax or ethyl oleate-wax is given by intramuscular injection only.

"Whiteside" Test for Abnormalities in Milk

Q. CCXVIII.—*Would you please give particulars of the "Whiteside" test for abnormalities in milk. How is the test carried out, what apparatus is required, and how should results be interpreted?*

A.—The reaction appears to be associated with the cell content

of the milk and the greater the number of cells the more rapid and viscid the reaction. As the increase of the leucocytes and epithelial cells may lag behind the appearance of clinical symptoms in any acute case, its value is restricted in such cases. It has, however, proved useful in the detection of such cases as inflammation of the udder of a chronic nature, giving a positive reaction before any clots or other clinical indications have appeared. As the process of resolution is frequently marked by the shedding of destroyed epithelial cells, leucocytes, etc., a positive reaction may be obtained after the causal agent—*e.g.*, *Strep. agalactiae*—has been eliminated.

The original test was devised by Whiteside (1939) (*Canad. Pub. Hlth. J.*, **30**, 44). As simplified in 1941 (Murphy, J. M. and Hansen, J. J., *Corn. Vet.*, **21**, 47-55), it consists in the adding of a drop of normal NaOH to five drops of milk on a glass plate. A black background is useful. The mixture is stirred with a glass rod for 20 seconds. The reaction can be graded arbitrarily into four classes. A strong positive is indicated by the rapid formation of a jelly-like mass, a slightly lesser reaction is indicated by marked flocculation and so on in reverse order, a slight reaction being shown by a just perceptible granulation. Occasionally a false positive may result if readings are delayed longer than two minutes.

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Correspondence

Synthetic Oestrogens in Caponizing

Sir,—Having caponized some hundreds of cockerels chemically by stilboestol implants, I cannot entirely agree with the published answer in *The Veterinary Record* of August 23rd.

Following publication of American work, in which it was claimed that cockerels were satisfactorily caponized by a 15 mgm. implant of pure stilboestrol, Messrs. Burroughs Wellcome kindly prepared compressed pellets of 15 mgm. pure stilboestrol with no excipient whatsoever, for use in this connection. During the first year cockerels were implanted at ages between 10 and 16 weeks with a single 15 mgm. pellet. The implant is placed subcutaneously high up in the neck and no complaints regarding residual stilboestrol have been received since the implant is in a portion of the neck usually discarded. The 15 mgm. implant was sufficient to suppress the development of male characters until the birds reached five and a half to six months, when secondary sex characters gradually appeared. In subsequent years implants have been increased to 30 mgm. and in only a very small proportion of cases do male characters appear before the bird is killed. The rate of absorption of the pellet is dependent upon its remaining intact, a point of some importance since the pellet is somewhat friable.

For best results so far as carcase quality and size are concerned, birds should be kept until 12 to 18 months of age and a repeat implant made if necessary. Such birds reach excellent weight and the flesh is of highest quality.

The chemical method is far superior to the surgical technique as casualties are nil and there is no setback in the growth-rate. Owners who have had experience of both methods always ask that the method used shall be the chemical one.

Yours faithfully,
Joan O. Joshua.

78, Brentway,
Finchley, N.3.
September 4th, 1947.

BRITISH BEEF BREEDS IN ARGENTINA

"What is the relative popularity of the British beef breeds in Argentina?" asks "Blythe" in the *Farmer and Stock-Breeder*, and continues: "Although Shorthorns are still the most popular, Aberdeen-Angus are undoubtedly coming more into favour.

"A sumptuous volume, just published by the Argentine Aberdeen-Angus Society, gives some interesting figures. In 1908 there were 58 Shorthorns and 4·3 Herefords to each Aberdeen-Angus, but by 1937 the proportion was 11·3 Shorthorns and 1·7 Herefords to one Aberdeen-Angus. The Society expects that the next census figures, shortly to be announced, will show an even greater gain. The breed has now more registered herds in the republic than any other.

"By 1945 Aberdeen-Angus entries at the Palermo Show increased until they were second only to the Shorthorns and for the sixth year in succession the breed has made top price of the seven to eight hundred bulls of all breeds offered for sale at Palermo.

"One other interesting point about the book is the photograph of the late Don Carlos Guerrero, one of the first, and amongst the greatest, of Argentine breeders of Aberdeen-Angus. His grandson, Dr. Carlos Guerrero, is to judge the breed at Perth next February."

Quarterly Meeting of Council, N.V.M.A.

Summary of Proceedings

A pleasing introduction to the business of the meeting of Council held in London on September 12th, with the President (Mr. L. Guy Anderson) in the chair, was the reported despatch by the President of a cordial message of greeting and good wishes to the American Veterinary Medical Association, in Annual Meeting assembled, and of a happy aftermath of Congress in letters from Dr. Plum, President of the Danish Veterinary Association, and Professor Bressou, Principal of the Alfort Veterinary School, in warm appreciation both of the memorable week spent in Edinburgh and of the work of the Association as a whole.

This note of cordiality again was sounded most acceptably when, under "Correspondence," an appreciative response was read to the letter addressed by the President of the Association to the Minister of Agriculture, assuring Mr. Williams of the full support of the Association in any step taken to meet the current crisis in the agricultural affairs of the nation, the more so as the achievement of his target for agriculture assuredly would necessitate the maximum employment of the services of the members of the veterinary profession.

Council was gratified, also, to have the opportunity at the call of the President, to welcome no fewer than 80 new applicants for membership—bringing the total to 3,190—and, further, heartily to endorse the action of the officers in sending a letter of good wishes to Mr. Steele-Bodger—a past president—and Mrs. Steele-Bodger on the occasion of their silver wedding. It then settled down to the consideration of a series of voluminous reports of committees.

From the report of the Parliamentary and Public Relations Committee it was learned that the newly-appointed Public Relations Officer, Mr. Geoffrey P. West, hopes to commence his duties at the end of October. Awaiting this event is consideration of the preparation of further editorials on the value of modern publicity to the profession, while the Committee is to draw up a policy in relation to articles for issue to the lay Press, with indications as to the part which the Public Relations Officer should play in relation thereto. Compilation of a pamphlet designed to stimulate interest in the N.V.M.A. among students, young graduates and others is in progress. Dr. Wooldridge, the Chairman, assured Council that this new Committee would welcome suggestions to enhance the value of its work.

Included in the wide range of subjects dealt with by the General Purposes and Finance Committee in its report, was an intimation that the Chief Veterinary Officer of the Ministry of Agriculture and Fisheries hopes soon to be in a position to resume discussions on the projected review of the Calfhood Vaccination Scheme, that the Pharmaceutical Society of Great Britain is desirous of collaborating with the profession on matters of mutual interest, and that all possible steps are being taken—here a strong assurance was given by the President—to rectify the unfortunate refusal of priority to veterinary surgeons in the provision of new motor cars.

In view of past uncertainties on the point, considerable interest attaches to the following parliamentary answer (quoted in the report) by Mr. Glenville Hall: "Civil servants are free to take part in the work of professional bodies, provided that their official work does not suffer and that they show a reasonable discretion."

The Veterinary State Medicine Committee received from its sub-committee a report embodying revised proposals for the control of certain diseases of dairy cattle. These are intended purely as a basis for discussion and negotiation with the National Farmers' Union and other bodies.

The terms of the Press Notice issued by the Ministry concerning the distribution of Swine Fever (Crystal Violet) Vaccine were the subject of resolutions from the Society of Veterinary Practitioners and the Lincolnshire and District Division. A representative of the latter Division instituted a discussion by supporting, among other things, his Division's criticism of the Ministry's reference in this Press Notice to the price charged to veterinary surgeons for this vaccine.

The artificial insemination centres operated by the Milk Marketing Board figured in this report. The Board are to be asked to make it clear in their literature that the Veterinary Officer of a

centre is the official responsible for its technical direction, while it is to be recommended to Divisions that the veterinary members of Advisory Committees of A.I. Centres should be asked to report to their Division annually.

The practice of overstocking cows at markets has long been deprecated by the profession, and agreement was expressed with a condemnatory resolution received from the National Federation of Women's Institutes. In the Committee's opinion the only remedy is the institution at sales of a stated hour for milking overnight.

A report from the Organizing Committee indicated that this committee was now ready to place before Council recommendations relating to the future working of the profession with animal welfare societies. Arrangements were made for this matter to be considered by the Council at a special meeting which will be held at an early date.

The Technical Development Committee had some progress and some "hold-ups" to report in the publication of material relating to many aspects of veterinary work. The welcome intimation was made that its future programme includes provision for the study of technical developments in the small-animal side of practice.

The following reference to the question of salaries of the veterinary staff of the Ministry of Agriculture appeared in the Home Appointments Committee's report: "The President made a statement on the position to date and indicated the course of action which had been decided upon by the officers, delegates and Capt. Barker." In reply to an enquiry as to the nature of this course of action, the President said: "As you know, it was agreed at Edinburgh that a letter be sent to the Minister and a special committee was formed to consider the reply which we received. We got quite a long reply, and we had a meeting of the officers and delegates and Capt. Barker. We mapped out a plan of action. *Re* the reply which will be made, we have prepared a long statement, for publication, together with an editorial, which will appear in next week's issue of *The Veterinary Record*. The trend of events is to try and re-establish contact with the Ministry at the highest level. If we do have a Special Meeting of Council in about a month, I hope by that time we shall know definitely whether it is possible to re-open negotiations with the Minister, and I think that would be a more suitable time to discuss the whole matter."

Council concurred, and accepted the report, which also covered an agreed note on the conditions of employment of young graduates in general practice; also an indication that, after the "finis" reply given by the Minister of Health to a question in Parliament as to why the public health duties carried out by the part-time officer to Barry Council should now pass, on his retirement, to a sanitary inspector, it was felt that no further action could usefully be taken. Nevertheless, Mr. Hall was heard most sympathetically when he reminded Council "We teach these people and qualify them and then they are appointed to do work which is properly within the province of the veterinary surgeon."

The Overseas Services Committee reported a wide range of activities calculated to improve the conditions of veterinary service in many colonies. The Association is to press for the post of Adviser on Animal Health to the Secretary of State for the Colonies to be made a full-time one, and also for the appointment of a full-time Deputy or Assistant Adviser.

In connection with applications from oversea veterinary associations for affiliation, Council accepted a schedule of conditions suggested by the Committee to guide the governing body of the Association in their acceptance or rejection.

The Editorial Committee reported that as the main step in applying compensatory measures to meet the great increase in printers' charges, the rates for both "display" and "small" advertisements had been raised substantially. It was satisfactory to record that information already had been received from many firms that the introduction of the new rates would not affect the volume of their advertising in *The Veterinary Record*.

Arising out of the report of this Committee, the following resolution was passed unanimously: "That the Council of the N.V.M.A. are perturbed that no accounts of proceedings of Council, R.C.V.S., have been published for over twelve months, and while they have every confidence in the leaders of the profession, would appreciate having that confidence reinforced by information of the action of the Council."

Finally, the members deservedly congratulated the President on his handling of his first—and unexpectedly arduous—quarterly meeting of Council.

Victoria Veterinary Benevolent Fund

ANNUAL GENERAL MEETING

The annual general meeting of the Victoria Veterinary Benevolent Fund was held at 10, Red Lion Square, London, W.C.1, on Tuesday, June 3rd, 1947, with Mr. Arnold Spicer, F.R.C.V.S., President, in the chair. The following were present: Professo G. F. Boddie, Messrs. Esmond Brown, Wm. Brown, Professors T. G. Browne, J. B. Buxton, Messrs. H. W. Dawes, R. E. Glover, W. R. McKinna, G. P. Male, Professors W. C. Miller, W. M. Mitchell Captains T. M. Mitchell, J. W. Procter, Major L. P. Pugh, Lieut.-Colonel P. J. Simpson, Messrs. H. W. Steele-Bodger, J. F. D. Tutt, Professor G. H. Wooldridge and Dr. W. R. Wooldridge.

The President: The minutes of the previous annual general meeting, having been printed and circulated, were taken as read and were confirmed and signed.

Election of Officers

President.—Professor G. H. Wooldridge: May I have the honour of proposing the re-election of our President. I think we cannot possibly do better, if we could even do anything approaching as well, than to re-elect our President.

Mr. G. P. Male: I have much pleasure in seconding that. The motion was carried unanimously.

Vice-Presidents.—It was proposed by Dr. Wooldridge and seconded by Captain Procter that the Vice-Presidents—Professor Buxton, Mr. Dawes, Mr. Male and Professor Wooldridge—be re-elected *en bloc*. The motion was carried unanimously.

Hon. Secretary.—It was proposed by Mr. Male and seconded by Dr. Wooldridge that Colonel Simpson be re-elected. Again, the motion was carried unanimously.

The President: I am sure you could not have anybody better. One does not realize how much work he has done.

Hon. Treasurer.—It was proposed by Mr. Dawes, seconded by Mr. Steele-Bodger, and carried unanimously, that Professor Buxton be re-elected as Hon. Treasurer.

Auditors.—Messrs. Wilkinson, Chater & Co. were re-elected auditors for the ensuing year.

Annual Report and Statement of Accounts

The President: Do you wish me to take this *en bloc* or go through it page by page?

Mr. Steele-Bodger: *En bloc.*

The President: Are you all in favour of accepting the report and accounts or does anyone wish to make any comments?

Mr. Steele-Bodger: I only wish to comment that I wish it were possible to increase the amounts to some of these people, and I would like the Executive to explore the possibilities.

The President: This year, owing to the generosity and hard work of the ladies and Mr. Whicher, we have distributed more in relief than any other year. We have not done badly.

Mr. Steele-Bodger: I appreciate that, but times are very difficult and one knows that £1 to-day goes a very little way really; if we could, if not by actual donations of cash, by gifts in kind, a store of food or anything like that, augment this, I think it would be money well spent.

The President: We have had an offer from the Australian Veterinary Association to send over parcels of food, and we are just wondering how we can deal with that. It is most likely that we shall send out a list of names of those most worthy of help for parcels to be sent direct to them. Otherwise we may have to go to the Government.

Captain T. M. Mitchell: I notice the income by subscriptions is just about two and a half times as large as it was the previous year and I wondered how much of that was due to the actual subscriptions and how much was due to income tax recovery. You will remember I have been harping on this string for some years and I am glad to see that this year the Council have instituted an appeal for members to sign covenants so that income tax could be recovered. I am wondering whether there are any shown in these accounts.

The Accountant: No income tax has yet been recovered on subscriptions because the first covenants only commenced to operate during last year. I submitted an appropriate claim in March of this year to the Inland Revenue Authorities and I have just heard from

them suggesting that I include this with the usual claim made later in the year.

Captain MITCHELL: So this is all income by subscription?

The PRESIDENT: That is largely because the donations made by the ladies—and the Bexhill Horse Show—were put in as subscriptions, by their request, in order that we could deal with them as grants.

Dr. WOOLDRIDGE: Might we know the number of covenanters?

The ACCOUNTANT: I think we have had 50, so far.

The PRESIDENT: We might send a note to remind people. It is almost bound to be a slow process but once it is in operation it is in operation for several years.

Election of Council.—The PRESIDENT: If you have no further remarks on the statement of accounts, we will pass to the election of ten members of the Association to serve on the Council. The present members serving are: Mrs. R. E. Glover, Professor T. G. Browne, Mrs. W. G. Wragg, Messrs. John Holroyd, H. W. Steele-Bodger, Dr. W. R. Wooldridge, Colonel G. B. Rees-Mogg, Mr. and Mrs. G. N. Gould and Captain J. W. Procter.

Is it your wish that we re-elect them *en bloc*?

It was proposed by Professor BUXTON, seconded by Captain MITCHELL and carried unanimously, that the Council be re-elected *en bloc*.

Covenanted Subscriptions

Reverting to this important matter, Professor MITCHELL asked if covenant forms had been issued to members. Receiving an affirmative reply from the PRESIDENT, Professor MITCHELL stated that he had not seen one, and enquired if that was because he paid through a Banker's draft? He continued: There might be others like myself who did not get the actual forms. I probably would sign a covenant and give a little extra and there must be others in the same position as myself.

Colonel SIMPSON: The covenant forms were printed and were included in every copy of *The Veterinary Record* going out at a certain date, and in addition to that, I think there was a short note in "Notes and News" that week, drawing attention to the covenant.

Dr. WOOLDRIDGE: May I ask whether we have any covenant forms here to-day?

The SECRETARY: Yes, and I have pleasure in handing you one.

The PRESIDENT: If there is no other business, that concludes the meeting. I thank you all for your attendance.

Professor WOOLDRIDGE: I should like to propose a vote of thanks to our President for presiding here to-day. In doing so may I say that I feel good results might have followed if the President had emphasized a little more our indebtedness to the special donors during the year. They are all down in the list, but when it comes to the report I feel it would be rather nice if they were mentioned. They were casually mentioned, in passing, but I think a special reference is due.

The PRESIDENT: I made a special reference to the ladies and to Mr. Whicher.

The meeting then terminated.

WORLD MEDICAL ASSOCIATION

The *British Medical Journal* reports the formation in Paris on September 18th of a new international Medical Society, the World Medical Association, and points out that its two principal objects are the first and third, which read thus: (i) To promote closer ties among the national medical organizations and among the doctors of the world by personal contact and all other means available; (iii) To study and report on the professional problems which confront the medical profession in the different countries. The Journal comments, "The W.M.A., in other words, would appear to be concerned principally with all those matters which are summed up under the term 'medical politics'."

The headquarters of the secretariat are to be in North America, and a handsome gift of 50,000 dollars a year for five years was announced by the United States delegates to finance the W.M.A. in its early years.

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For four years running there has been a reduction in the number of persons admitted to the Medical Register, and during 1946 the number of registrations was lower than in any year since 1937. The *British Medical Journal* suggests that the smaller numbers are a reflection of the reduced entry to the medical schools during the war and that a low entry is to be expected for some years to come. In 1946 the number registered was 2,237 (the peak year was 1942 with 3,556 registrations, the highest ever recorded). The number of medical students admitted in the year 1946-47 was 2,553.

NOTES AND NEWS

Diary of Events

Oct. 6th.—Meeting of the Farmers' Club, at the Royal Empire Society, W.C.2, 2.30 p.m. *Speaker*—The Rt. Hon. Tom Williams, M.P., Minister of Agriculture and Fisheries.

Oct. 8th.—Meeting of the Editorial Committee, N.V.M.A., 36, Gordon Square, W.C.1, 2.30 p.m.

Oct. 15th.—Meeting of the South-Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Oct. 16th.—Annual Meeting of the Central Veterinary Society, at the Royal Veterinary College, Camden Town, N.W.1, 2 p.m.

Oct. 22nd.—Special Meeting of Council, N.V.M.A., at the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2, 11.30 a.m.

Oct. 24th.—Autumn Meeting of the Eastern Counties Division, N.V.M.A., at Colchester (Red Lion Hotel), 2.15 p.m.

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PERSONAL

Appointments.—The Colonial Office announces the appointments of Mr. K. J. Garnett, M.R.C.V.S., as Veterinary Officer, Department of Agriculture, Fiji, and of Mr. K. Unsworth, B.V.SC. (LIV.), M.R.C.V.S., as Veterinary Officer, Nigeria. From 1943 to 1945 Mr. Kenneth Unsworth was a Research Assistant in the Department of Parasitology, School of Tropical Medicine, Liverpool. Later he became Lecturer in Veterinary Parasitology at Liverpool University. Recently, in conjunction with the Colonial Office and Liverpool University, Mr. Unsworth undertook an extensive tour in Africa, visiting veterinary laboratories and institutions, and observing the work and special problems of Veterinary Officers.

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Birth.—HAY.—On September 22nd, 1947, at Queen Mary Nursing Home, Derby, to Dorothy, wife of Tom Hay—a daughter.

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Marriage.—CASE—FARMAN.—On September 24th, 1947, Basil Leonard Sully Case, of Lisvane, Glam., to Mary Joan Farman, M.R.C.V.S., of 10, Newport Road, Cardiff.

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R.C.V.S. OBITUARY

The Late Capt. Howard Barker Collet, D.V.M., M.R.C.V.S.

AN APPRECIATION

(Contributed)

With the passing of Howard Collet, recorded in your issue of September 20th, the veterinary profession has lost a worthy and respected member.

Born in Fiji in 1885, the eldest son of Sir Wilfred Collet, K.C.M.G., he was educated at Highgate and Stamford. At 19 he sought adventure in Canada, farmed for some time and later joined and served for three years with the North West Mounted Police. He then decided to study veterinary science and bought his discharge from that force. In 1911 he qualified B.V.Sc. (Toronto), practised for two years and then entered the Canadian Ministry of Agriculture—Health of Animals Branch—where he was engaged in meat inspection.

On the outbreak of world war No. 1 he enlisted in the Army Veterinary Corps by way of the Canadian Expeditionary Force, serving in France and Egypt. He qualified M.R.C.V.S. with some distinction at the Royal Veterinary College in 1920 and returned to Canada the same year to resume duty with the Canadian Ministry of Agriculture.

Returning to England after a period as lecturer in hygiene at Ontario Veterinary College, Capt. Collet settled down to practise in the Vale of Aylesbury. He served for several years as examiner in Materia Medica for the R.C.V.S. In 1935 he was appointed Chief Veterinary Officer of Buckinghamshire and remained in Bucks following his appointment as Divisional Inspector of the Ministry of Agriculture and Fisheries in 1938 until his retirement in 1945.

Above all else Collet loved the countryside and having planned to enjoy his retirement farming in Aylesbury district, it was a sad moment in his life when, through a breakdown in health, he had to abandon the project and sell his farm. Not least amongst those who mourn a lost friend are the farmers in the Vale of Aylesbury, so many of whom he had befriended in the depressed days between the wars when he practised amongst them. They

like all of us, recognized his sound veterinary knowledge, high degree of professional skill and personal integrity.

To his widow and son we would all wish to express deep sympathy at this time.

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VETERINARY EDUCATIONAL TRUST

Projected Station for Research into Diseases of Domestic Animals

Having successfully launched its centres at Newmarket for research into equine and canine diseases, we learn that the Veterinary Educational Trust is contemplating an extension of its activities into research into the major diseases of farm stock—a development of great significance in view of the major role animal husbandry must play in the achievement of the Government's programme for agriculture.

Negotiations are proceeding with a view to purchasing an estate where research into the diseases of dairy and beef cattle, sheep, pigs and poultry will be carried out. Nutritional troubles, infertility and the diseases of young stock will be among the first investigations made. In the same connection, and in view of the lack of trained research workers in livestock diseases, the Finance Committee of the Trust has recommended that applications for three new scholarships should be invited.

The Veterinary Educational Trust announces that for the year 1947-48 it has already granted £5,490 in scholarships and studentships. Studentships are virtually grants in aid made to promising young men who are finding it difficult to meet the financial costs of their courses. The Finance Committee takes the view that in future any studentship grants should be considered by the students as loans, to be repaid by them when they are in a position to do so.

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D.D.T. and the Aeroplane in the Control of the Tsetse Fly and Trypanosomiasis in S. Africa

The Imperial Bureau of Animal Health arranged a meeting which was held on September 24th at the London School of Hygiene and Tropical Medicine, to see a film and hear an address by Dr. P. J. du Toit, Director of Veterinary Services, Union of South Africa, on a very large-scale experiment to control the tsetse fly by spraying D.D.T. from aeroplanes.

Dr. du Toit gave an illuminating account of the problem and of the experiment. The South African workers have made a very intensive study of the tsetse fly in Zululand for many years, their work culminating in a large-scale experiment in which about 100 square miles of "fly" infested territory has been sprayed several times by aeroplane in a manner designed to ensure a good "kill" of the flies present at one stage or another at the time the spray was started. The results have been gratifying; there has been a very useful reduction in the numbers of flies present in the area down to about 1 per cent., in the months succeeding the spraying.

The film was prepared under the supervision of the staff of the Onderstepoort laboratory. It is in colour and has a sound track. The design of the film, the execution and the commentary are all excellent, and the staff are to be congratulated on this second ambitious film on a veterinary subject that we have seen. Incidentally, the film has been left in the office of the High Commissioner for the Union of South Africa and can be borrowed for showing at meetings.

Mr. Heaton-Nicholls, High Commissioner for the Union of South Africa, gave a graphic account of the effect of the tsetse fly in Zululand. As a Member of Parliament in South Africa, Zululand was in his territory and the losses from trypanosomiasis in cattle were the cause of great anxiety. After the first world war settlers with small capital attempted to develop farms in the "fly" areas of Zululand. The losses in their cattle from trypanosomiasis were so high that numbers had to leave their farms and became bankrupt.

A paper giving full details of the work done will appear in *The Veterinary Record* shortly.

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LEGAL NOTES

The Practitioner's Responsibility.—In its issue of September 20th *The Lancet* observes that the annual report of the Medical Defence Union,[1] presented to the annual meeting, reminds members of many old and some new risks to which they may be exposed in their daily work. "It emphasizes the significance of the High Court decision in the case of Dodd *v.* Wilson.[2] In 1945 a firm marketing drugs urged veterinary surgeons to use one of their preparations, described as corynebacterium toxoid, in the treatment of summer mastitis in dairy cattle; and assurances were given by the managing director that this toxoid was harmless. Two dairy herds were inoculated by veterinary surgeons, and 60 cows subsequently became seriously ill. The farmers sued the veterinary surgeons, who joined as co-defendants the suppliers of the toxoid; and they in their turn joined the manufacturers. Mr. Justice Hallett said that if the veterinary surgeons had recommended the toxoid, supplied it, charged for it, and left the farmers to administer it they would undoubtedly have been liable. If they had rendered a bill charging for the toxoid and for their services as separate items they would also have been liable. The judge did not see how their liability was diminished by their having themselves injected the toxoid. He maintained that there was an implied condition in the contract between the two parties that the substance to be used for inoculation should be reasonably fit for the purpose. This condition, he observed, had not been met; and the farmer could therefore recover damages from the veterinary surgeons, the veterinary surgeons could recover from the suppliers, and the suppliers from the manufacturers. 'A proposal,' concludes the report, 'has been made that a form of disclaimer of warranty would afford protection to practitioners, but this would be impracticable and cumbersome and cannot be seriously considered as a remedy for the new state of affairs that appears to exist.'"

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[1] Annual report for 1946-47. From the offices of the Union at 49, Bedford Square, London, W.C.1.

[2] The proceedings in this case were reported fully in *The Veterinary Record*. **59**. 55; 126; 130 and 183.—Editor, *Vet. Rec.*

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Swine Fever:

Lincs. (Kesteven).—Blankney Dales, Stixwould, Lincs. (Sept. 27th); Highfields, Evedon, Sleaford (Sept. 29th).

Northumberland.—Sough House Field, Northumberland Dock Road, East Howden (Sept. 27th).

Sheep Scab:

Derbyshire.—Kiln Hill Farm, Hope, Sheffield (Sept. 26th); Greenwood Farm and Mitchell Field Farm, Hathersage, Sheffield (Sept. 27th).

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THE VETERINARY EXHIBITION AT CONGRESS

We regret that the following item reached us too late for inclusion in our Congress Number, issued last week:—

The International Serum Co. (41, Sunningfields Road, Hendon, N.W.4) exhibited on their stand their products comprising sera and vaccines produced in their own laboratory at Hendon, such as preparations for the prophylaxis or treatment of abortion in cattle, blackleg, braxy, canine and feline distemper, haemorrhagic septicaemia, joint ill, lamb dysentery and pulpy kidney, mastitis, staphylococcus and streptococcus infections, swine erysipelas and swine fever, tetanus and white scour; furthermore, their *Penicillium* products, Vivicillin, Pennotin and Vivipennin, were on view.

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ARTIFICIAL INSEMINATION OF CATTLE

Great Progress Reported to Milk Marketing Board

A report made to the Milk Marketing Board by Mr. J. Edwards, head of the Dairy Husbandry Department, records great progress in the use of artificial insemination of cattle to increase herds and raise winter milk production.

During the year from April, 1946, to March, 1947, 25,535 new inseminations were carried out at the Board's centres, compared with 6,401 in the previous year. The greatest number of inseminations was carried out between January and March, so as to encourage winter milk production. The number of inseminations at non-Board centres during 1946-47 was about 35,000, so that the total number of inseminations in England and Wales was about 60,000.

The Board has now nine breeding centres, five of which were opened during 1946-47. Of every 100 first inseminations the number that held was 64·6. This result is stated to be at least as good as normal mating.

Low Fertility Herds

One of the most important findings of the report is that 57·9 per cent. of all herds of ten or more cows have a conception rate between 50 per cent. and 75 per cent. and that more than 20 per cent. have a conception rate above 75 per cent.

On the other hand, there were 20 per cent. of all herds in which the conception rate was lower than 50 per cent. "This group included a small number which have been known, at the time of entry for insemination, to be 'trouble' herds, but the majority are herds in which low fertility, due to partial sterility, has been revealed by A.I."

Concluding, the report says: "While A.I. cannot effect a cure in all such cases, it is worth something to know where the deficiency lies and to be able, with veterinary aid, to concentrate on the treatment of cows."

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Free Artificial Insemination Service from "Colour-marking" Beef Bulls

As recently indicated in our columns, as an important part of the Government's plan to stimulate meat production and thus help to reduce the expenditure of "hard currency," arrangements are being made by the Ministry of Agriculture and Fisheries for farmers to be offered a free artificial insemination service from "colour-marking" beef bulls for use in the production of calves for rearing and feeding into beef.

The object of the scheme for free artificial insemination service (states a Ministry of Agriculture announcement) is to extend the use of colour-marking beef bulls on dairy cows of only moderate milking capacity so that their progeny can be put to good use for beef instead of being slaughtered as bobby veal or introduced into a dairy herd to perpetuate the low-yielding propensities of their dams. In order to minimize the risk of unsuitable calves being reared as dairy replacements, it has been decided that the free service shall be available only from *bulls of beef breeds that colour-mark their calves; i.e.*, Hereford, Aberdeen Angus and Galloway. It is recognized that bulls of various other breeds could be expected to produce calves equally suitable for beef; but it is equally important that the dairy side of the livestock industry should be properly protected against the introduction of unsuitable stock. The free beef service is primarily a means of ensuring the "salvaging" and suitable use of the progeny of the low-yielding dairy cow in the present emergency.

The free service will be available from existing artificial insemination centres and sub-centres and from those shortly to be established and began to operate on October 1st. The free service will not, however, be immediately available throughout the areas covered by the present centres. Bulls will have to be carefully selected, examined and tested for quality and health, approved by the Ministry, purchased and located; extra staff, transport and equipment will need to be provided; and many other problems will have to be overcome. But a start was made on October 1st and every effort will be used to expand the scheme as rapidly as possible.

It cannot be over-emphasized that this scheme is related solely to the production of good beef stores from dairy cows that are unsuited to produce dairy replacements: it is not intended that beef bulls shall be used on the higher-yielding dairy cows to the future detriment of milk production. Careful records of the use to which the scheme is put will be kept and inspected at frequent intervals by officers of the Ministry; and steps will be taken to ensure that the scheme is used strictly for the purpose for which it is intended, even to the extent of requiring centres to withhold the free service in cases where its objects have been or are likely to be abused.

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BAN ON THE IMPORT OF BOOKS

The Board of Trade has announced a ban on the import of books from all countries except by individual licence. While it is not yet known how serious the effect of this rule will be, it is all too obvious that this constitutes one more regrettable restriction on the availability of scientific knowledge, the free flow and interchange of which is vital to progress in the veterinary sphere as in all realms of science. It is, moreover, a step which will throw into yet higher relief the handicaps under which the veterinary graduate and student alike are labouring through the almost insuperable difficulties attendant upon the publication of new works, the issue of revised editions and the provision of text-books.

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Sir John Boyd Orr recently told the World Food Council it would be much stronger if Russia were a member. It was a "great disillusion" for him that Russia had not ratified the constitution of the F.A.O. and had "done nothing to help in the present crisis." He added: "If, however, Russia sees the council are doing a good job, I am ready to bet even money she will be at the next conference."—*Reuter.*

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents should write as briefly as possible and letters should not exceed 350 words.

ASCERTAINING "REPRESENTATIVE" OPINION

Sir,—After reading the communication from the correspondent to these columns in the issue dated September 20th, I am forced to the conclusion that he would be most unwise in his present frame of mind to choose the field of general practice.

At the same time, I am in full accord with those who are out for a fair salary, and an appreciation on the part of the employer that whenever circumstances permit leisure should be given, and that the employee should be treated with the fullest consideration.

Very few practitioners to-day, who expect efficient assistance, are so short-sighted as to deny a good salary and time off, but I do not consider that it is practicable owing to the varying conditions of veterinary practice to devise a plan which can be applicable in a general sense when it comes to leisure.

It is becoming increasingly clear that to-day the country as a whole owes its present position, not to the nature of the Government in power, but to the inordinate demand of all classes of the working population for a scale of remuneration, coupled with reduced hours of work, out of all proportion to what these give in return.

It has long been recognized that the best cure for an agitator is to give him the job which he so much criticizes, and I would suggest that if your correspondent took on the post of the principal (who he seems to think is akin to a gold-mine) he would very soon ask to revert to the position of an employee.

In these times when I engage an assistant at a commencing salary of £500 a year (which in these days I regard as the minimum for an efficient qualified—single—man) and have provided him with transport, I calculate that there is little change left out of £1,000. Unless in return I receive £1,500, then I consider that I am better off without him.

Yours faithfully,

"Rothiemurchus," J. F. D. Tutt.
St. Cross, Winchester.
September 21st, 1947.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
Aug. 16th to 31st, 1947	4	—	20	—	6	1
Corresponding period in—						
1946	1	—	—	—	2	9
1945	7	—	—	—	1	43
1944	4	18	—	—	5	117
Jan. 1st to Aug. 31st '47	67	103	716	1	41	20
Corresponding period in—						
1946	65	31	—	7	41	306
1945	78	101	—	6	49	659
1944	127	63	—	6	67	724

Note.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at August 31st, 1947, was as follows:—

England	Wales	Scotland	Total (Great Britain)
8,629	10 853	9,493	28,975